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ABSTRACT

Intended to assist teachers as they assess, plan for, and teach deaf blind students, this manual describes a process for adapting curricula for students who function within the 0-24 month developmental period, also known as the sensorimotor period. The manual's first section provides an overview of project activities including the literature review, field tests, development of curriculum adaptations, and data analysis. Included also are a discussion of early childhood curricula with suggestions for selecing curricula for deaf blind students and a description of the sensorimotor period of development noting developmental lags and atypical behaviors observed in many deaf-blind children. Part 2 of the manual describes the following steps for adapting curricula: (1) collect functional assessment data; (2) plan functional individualized program; (3) implement adapted activity; and (4) maintain and generalize new skills. In Part 3, 14 examples of adapted activities exemplifying concepts of means ends/causality, spatial relations, object permanence, and relationshp to objects are given. Five readings on orientation and mobility, vision, hearing, toy selection, and sensory integration are presented in the fourth section. Appendices cite 32 relevant curricula, over 200 materials described by sensory features, and screening forms and checklists for the curriculum adaptation process. (CB)

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Curriculum Adaptations for the Deaf-Blind: the Sensorimotor Period

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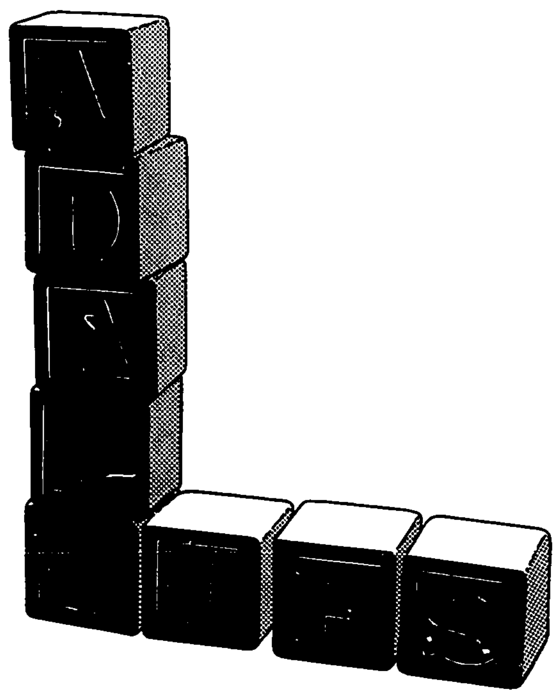

A Process Approach by Judy A. Goodrich & Patricia G. Kinney

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A D A P T I P S

Adapting Curricula for Students Who Are Deaf-Blind And Who Function In The Sensorimotor Developmental Stage

Prepared by

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September, 1985

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ADAPTIPS

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PART ONE

OVERVIEW OF THE PROJECT

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INTRODUCTION

Based on the results of research, feedback from parents and teachers, and an analysis of existing resources, a process for adapting curricula was developed by the Curriculum Adaptations for the Deaf-Blind Project at the University of Kentucky. Due to the unique characteristics and needs of children who are deaf-blind, a cookbook of adapted activities is not enough. This manual is presented to assist teachers as they assess, plan for, and teach their students who are deaf-blind.

Part One of this manual begins with an overview of the project activities. This is followed by "What Is Curricula?" a discussion of early childhood curricula and suggestions for selecting curricula for students who are deaf-blind. The "Sensorimotor Period and the Deaf-Blind Child" describes the sensorimotor period of development, according to Piagetian theory, and discusses developmental lags and atypical behaviors observed in many deaf-blind children.

Part Two describes the process for adapting curricula developed by the Curriculum Adaptations Project. Part Three, titled "Examples of Activities," presents considerations for teaching sensorimotor skills to children who are deaf-blind. Several examples of how one might adapt a curriculum activity for a child who is deaf-blind are also included.

Part Four, "Supplemental Information," is a collection of five readings that should be of interest to both educators and parents. Topics include orientation and mobility, vision information, auditory information, toy selection, and sensory integration.

The last section of this manual consists of three appendices:

<u>Appendix A</u>: A current listing of curricula that includes skill aquisition in the sensorimotor period of development, their purchase source, cost, and a brief description of the contents.

<u>Appendix B</u>: A resource list of commercially available materials and toys that has been categorized by sensory features. Approximate costs and purchase sources, where known, are also provided.

<u>Appendix C</u>: A collection of forms and functional sensory screenings that will enable teachers to collect the background information that is necessary in carrying out the activities of the Adaptip Process.

Overview of Curriculum Project Activities

The Curriculum Adaptations for the Deaf-Blind Project was funded by grant # G008202726 (U.S. Department of Education, Office of Special Education Research) to develop curriculum adaptations that can be used by educators providing services to children who are deaf-blind and who function in the 0-24 month developmental range (also known as the sensorimotor period in Piagetian theory).

During the three year period of this grant, the following global tasks were completed:

1. Review of literature, curricula analysis, and selection of a curriculum for developing adaptations.
2. Development of curriculum adaptations.
3. Field testing of adaptations.
4. Analyzation of data.
5. Dissemination

This section summarizes activities that were carried out in completing these tasks.

Review of Literature, Curricula Analysis, and Selection of Curriculum for Developing Adaptations

A review of literature, including several computer searches, was conducted to obtain recent findings and products related to curriculum development for children who have sensory impairments. Regional Centers for the Deaf-Blind were also contacted to obtain information that had been collected through previous surveys and/or research.

A curriculum analysis form was developed by the project staff and used to analyze 32 curricula. The intent of the analysis was to identify one or more curricula that could be used as a basis for developing adaptations for the deaf-blind. The areas addressed in the analysis of these curricula were:

Source and Ordering Information
Target Population
Philosophical Basis
Curriculum Format
Instructional Areas
Content and Subject Matter
Learner Response Variables

Evidence of Effectiveness
Content of Intructor Guide or Manual
Physical Characteristics
Preparation Necessary for Use

The North Carolina Curriculum for Handicapped Infants and Children was selected for use in developing adaptations for field testing. This curriculum covered the sensorimotor period of development, included educational domains within the developmental sequences, and recognized the need to adapt curriculum activities for children who were sensorily impaired.

Development of Curriculum Adaptations

Based on the review of literature, opinions of professionals, and previous observations of students who were deaf-blind, it was decided that adaptations would fall into three primary categories: 1) materials 2) instructional objectives or expected student response, and 3) methods or techniques in presenting the activity.

Because each child who is deaf-blind has individual abilities and needs, it was also determined that there was no "one solution" to any given curriculum activity. Instead, a process approach to developing individualized adaptations was developed. This process has been detailed in the latter part of this manual.

Field Testing of Adaptations

From all evidence gathered, this project was the first one to reliably test the effectiveness of curriculum adaptations used with students who are deaf-blind.

Adaptations were field tested in a variety of educational settings throughout the state of Kentucky. These settings included preschool programs for the handicapped, public school settings, residential schools, and intervention programs in both natural and foster homes.

Teachers who had expressed an interest in field testing were asked to complete background information forms as well as provide information about their students' levels of functioning and response to materials. Based on this information, activities were selected from the North Carolina Curriculum for Handicapped Infants and Children. The activities selected were at a developmental level thought to be appropriate for the given student, but were ones to which the student did not respond or did not demonstrate mastery.

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The ten teachers who participated in the field testing had a variety of background training and experience. The nine students ranged in age from 18 months to 16 years and were functioning in at least one educational domain at the sensorimotor level. Eighteen adaptated activities were successfully field tested.

An alternating treatment design (Barlow & Hayes, 1979) was used to compare the effectiveness of the unadapted and adapted condition. This design allows the comparison of two treatments: in this case, the unadapted objectives/materials/activities were compared to the same objectives/materials/activities when adapted for deaf-blind students. The order of unadapted and adapted activities was alternated through random selection. Thus, for one session the unadapted condition was presented first. For another session the adapted condition was presented first. In the alternating treatment design, the subject served as his/her own control. An adaptation was considered effective if in the sesssions where the adapted materials were used, the student was able to perform the task more correctly or more quickly than in the sessions where the unadapted materials were used.

Analyzation of Data

A visual and statistical analysis was conducted for each of eighteen sets of data. Graphed data were analyzed visually according to data stability, data overlap, and multiple treatment interference. A one-tailed t-test (Edgington, 1980) was used to statistically compare the two treatments.

Fifteen of the eighteen sets of data supported the superiority of the adapted condition when compared to the unadapted condition. Of these fifteen, three were found to show better performance in the adapted condition, but had decelerating or unstable trends.

The statistical analysis found the student performance to be significantly different, ranging from the .05 - .0004 levels in thirteen of the eighteen studies. Two were found to be significantly different at the .06 level. All of these supported the superiority of the adapted condition.

Dissemination

Dissemination of the project findings with related instructional materials was carried out through

training workshops to teachers, presentations at professional conferences (TASH, CEC, etc.), individualized training at educational sites, and through the development of this manual.

A total of 525 persons attended dissemination workshops and it is estimated that 500 received information through conference activities such as poster sessions, presentations, information sharing sessions, etc.

Throughout all of the dissemination activities, written feedback was obtained from the participants on the information shared. Their input was used to further clarify the process for eventual inclusion in this manual.

References

Barlow,D.H. & Hayes, S.C. (1979). Alternating treatments design: One strategy for comparing the effects of two treatments in a single subject. Journal of Applied Behavior Analysis.12. pp 199-210.

Edgington, E. S. (1980). Random assignment and statistical tests for one-subject experiments. Behavioral Assessments, 2, 19-28.

CURRICULUM: WHAT IS IT?

This manual describes a process for adapting curricula for students who are deaf-blind and who function within the 0-24 month developmental period, also known as the sensorimotor period. Available curricula that cover the sensorimotor period have been reviewed and are included in APPENDIX A. The following section is presented to assist in the selection, analysis, and evaluation of curricula to be used with students who have dual sensory impairments. These questions will be answered:

* **What are curricula?**

* **What should I know before I select a curriculum?**

* **What issues should I consider when I use curricula to plan for students who are deaf-blind?**

* **What curricula are commercially available and how do I purchase them?**

WHAT ARE CURRICULA?

Simply defined, curriculum is the content of instruction. It gives the teacher information about what to teach and may include some basic strategies and activities for teaching (Wolery, 1983). In his "Curricula Without Recipes," Brinker (1985) suggested that future curricula in special education should evolve from the teacher's knowledge of the student's competencies as those skills are expanded. More specifically, Bailey, Jens, and Johnson (1984) stated that a curriculum should include: (1) the content of instruction; (2) strategies for teaching/learning; and (3) a means for assessment.

As philosophies of curricula vary, so does the structure of curricula. One format can be simply a series of [illegible] skills that are considered important. A more comprehensive curriculum might include discussion of learning theory and teaching strategies, relevant research on effective strategies for teaching the target skill, examples of activities, suggested materials, and data collection procedures.

Many curricula have been developed by early education programs, [illegible] programs, special education [illegible], and [illegible]. Curricula are now available for infant programs, preschool programs, and [illegible] programs. Curricula targeted for specific populations include infant curricula (e.g., [illegible]), hearing impaired (e.g., Clark and [illegible], [illegible]), visually impaired (e.g., Oregon Project, [illegible]), multihandicapped sensory impaired (e.g., [illegible], [illegible]), and Down's Syndrome (e.g., [illegible], [illegible]). Topical curricula include vocational (e.g., [illegible], [illegible]), communication (e.g., [illegible], [illegible]), motor ([illegible] & Powell, [illegible]), and self-help (e.g., Fredericks et al., [illegible]).

WHAT SHOULD I KNOW BEFORE I SELECT A CURRICULUM?

Theoretical Basis

How do children learn? Is it the result of maturation, or the way in which the environment is structured, or the interaction between the child and the environment, or a combination of all of these? A curriculum should have a theoretical statement about how children learn. The overall goals and objectives, content, strategies for implementation, and the role of the teacher should be [illegible]. The intervention program should determine whether or not the theoretical base, overall goals and objectives, and strategies of the program and the curriculum match.

Many early childhood special education curricula are a combination of more than one theoretical approach. A trend to approach early intervention for handicapped children with an eclectic perspective is evidenced in current curricula and intervention models. The following is a discussion of perspectives that have traditionally determined the content of curricula.

Developmental Milestone Model: The developmental milestone model is based on normal theory of development (Gesell, 1940; Bayley, 1969). Tasks are traditionally divided into major areas of development (cognition, gross & fine motor, language, social, and self-help) and skills are sequenced vertically. Many variations of this model can be found in available curricula.

Developmental Theory Model: The content and strategies of a curricula may be developed according to a specific theory of development. Although limited to cognition and pre-symbolic language, the theory of infant development proposed by Jean Piaget has had a significant impact on early childhood curricula. Curricula based on Piagetian theory of development are organized according to a hierarchical structure of development. Cognition is divided into seven domains of intelligence (object permanence, means-ends, causality, spatial relations, vocal imitation, gestural imitation, and schemes for relating to objects). Dunst (1981) has expanded Piagetian theory of sensorimotor development to include the social-linguistic aspects of sensorimotor development in intervention efforts.

Functional Model: The content of curricula derived from a functional perspective is based upon tasks identified as essential for independent living. Considering future environments the teacher must determine "What essential tasks does a student need to function in a variety of settings?" Teachers of young children might provide instruction in all areas of development, but establishing a communication system for a sensory impaired child may be given high priority.

With any curricula teachers must determine what their teaching priorities are. As Dunst (1982) suggested, Don't select a behavior to teach simply because it is included in a curriculum. If you can't think of a functional reason to teach a behavior, then don't teach it.

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STRATEGIES

Bailey, Jens, and Johnson (1983) identified two teaching strategies or approaches in infant curricula: (1) experiential and (2) behavioral. The experiential strategy is derived from the assumption that children learn through experiences. The teacher's role is to assess the current functioning level of the child and to orchestrate appropriate learning experiences in the environment to facilitate development. Reinforcement occurs through natural consequences.

A behavioral strategy emphasizes the technology of instruction and continuous monitoring of instructional effect. If a child does not learn a targeted skill, then it is the fault of the instructional program. Task analysis, systematic cues and reinforcement, and data collection are all components of behavioral technology.

WHAT ISSUES SHOULD I CONSIDER WHEN I USE CURRICULA TO PLAN FOR STUDENTS WHO ARE DEAF-BLIND?

Research indicates that the development of children with sensory impairments will differ from that of sighted and hearing children. A visually impaired child who does not walk at 20 months may appear delayed when compared to his sighted peers. When compared to other children with visual deficits, his development is very normal. Fraiberg (1977) found that visually impaired children did not move independently until they directly reached to sound cues alone at 10 1/2 months. In a study of sixteen hearing impaired children who were chronologically 0-24 months, Best and Roberts (1976) found normal development in all areas but one, that of vocal imitation.

Although research supports the premise that visually impaired and hearing impaired children will develop in similar sequence to that of normal children, little if any research has been done concerning normal development for the deaf-blind. This task may be impossible, due to the heterogeneous nature of this group.

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Due to their unique characteristics, there will never be one curriculum appropriate for the deaf-blind. The teacher should have knowledge of developmental sequences and awareness of developmental theories such as Piaget's as she or he plans **functional** educational programs for his or her students. Teaching strategies should be selected according to what works best considering the skill to be taught, the child, and the teacher. Results of formal and informal sensory assessments, careful selection of materials, history and motivation of the child, interpretation of atypical behaviors in the child's repertoire, communicative behaviors, and relevant research must be considered as teachers plan intervention. This manual is presented to assist teachers in this endeavor.

WHAT CURRICULA ARE COMMERCIALLY AVAILABLE AND HOW DO I PURCHASE THEM?

This information is provided in Appendix A of this manual.

Questions to ask when selecting curricula for children who are deaf-blind and developmentally 0-24 months:

1. Is the curriculum based on a theory of early development and learning?
2. Are the goals of the curriculum consistent with the goals of the intervention program?
3. Is the target population of which the curricula is intended for identified? Are effectiveness data of the curriculum presented?
4. Do skill sequences in the curriculum include those needed by the children and do they extend beyond current levels of functioning?
5. Are the objectives/activities broken down into sufficient step sizes?
6. Are adapted developmental sequences provided (e.g., tactile location of objects—>object permanence; gestural communication)?
7. Is an assessment tool provided or is one suggested?
8. Is a data collection system provided?
9. Are critical functions of skills identified or explained?
10. Are teaching strategies provided?
11. Does the organization of the curriculum assist in planning for vertical as well as horizontal expansion of skills?
12. Are resources suggested for additional information (communication, orientation & mobility, structuring the environment)?
13. Are many activities suggested per each skill to facilitate expansion of skills?
14. Are functional skills and functional skill planning included in the curriculum?
15. Are teaching activities for generalization of skills included and described in sufficient detail?
16. Can staff implement the curriculum?

* Adapted from Wolery (1983) and Fewell & Kelly (1983).

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References

Anastasiow, N. J. (1981). Early childhood education for the handicapped in the 1980s: Recommendations. Exceptional Children, 47 (4), 276-282.

Bailey, D. B., Jens, K. G., & Johnson, N. (1983). Curricula for handicapped infants. In S. G. Garwood & R. R. Fewell (Eds.), Educating handicapped infants. Rockville, MD: Aspen.

Bailey, D. B., & Wolery, M. (1984). Teaching infants and preschoolers with handicaps. Columbus, OH: Charles E. Merrill.

Bayley, N. (1969). Bayley Scales of Infant Development. New York: Psychological Corporation.

Best, B., & Roberts, G. (1976). Early cognitive development in hearing impaired children. American Annals of the Deaf, 121, 560-564.

Brinker, W. (1985). Curricula without recipes. A challenge to teachers and a promise to severely mentally retarded students. In D. Bricker and J. Filler (Eds.), Severe mental retardation: from theory to practice. (pp. 208-229).

Clark, T., and Watkins, S. (1985). SKI*HI home intervention program adaptation. Logan: Project SKI*HI.

Dunst, C. J. (1981). Infant Learning: A cognitive-linguistic intervention strategy. Hingham, MA: Teaching Resources.

Dunst, C. J. (1982). Theoretical bases and pragmatic considerations. In Joan D. Anderson (Ed.), Curricula for high-risk and handicapped infants. Technical Assistance Development System (TADS). Chapel Hill, NC.

Fewell,R. R., & Kelly, J. F. (1983). Curriculum for young handicapped children. In S. Gray Garwood (Ed.), Educating young handicapped children. Rockville, MD: Aspen.

Fewell, R. R. & Sandall, S. R. (1983). Curricula adaptations for young children: visually impaired, hearing impaired, and physically impaired. Topics in early childhood special education, 2(4), pp. 51-66.

Folio, R., & Fewell, R. (1982). Peabody development motor scales. Hingham, MA: Teaching Resources Corporation.

Fraiberg, S. (1977). Insights from the blind: Comparative studies of blind and sighted infants. New York: Basic Books.

Fredericks, H. D., et al. (1980). The teaching research curriculum for moderately and severely handicapped. Springfield, IL: Charles C. Thomas.

Gast, D. L. & Wolery, M. (1985). Severe developmental disabilities. In W. H. Berdine and A. E. Blackhurst (Eds.), An Introduction to Special Education (pp.469-519). Boston: Little, Brown .

Gesell, A. (1940). The first five years of life: A guide to the study of the preschool child. New York: Harper.

Hanson, M. J. (1977). Teaching your Down's Syndrome infant. Eugene, OR: University of Oregon.

Jackson Education Service District (1978). Oregon project for visually impaired and blind preschool children. Medford, Oregon.

Langley, M. B. (1980). The teachable moment and the handicapped infant. ERIC Clearinghouse on Handicapped and Gifted Children: Reston, VA.

McInnes, J. M. and Treffry J.A. (1982). Deaf-blind infants and children. Toronto, Canada: University of Toronto Press.

Ski*Hi Institute. (1984). Insite Curriculum Manuals. Logan, UT: Utah State Univeristy.

Stone, G., and Wade, A. B. (1980). Austin work skills curriculum. Austin: Texas School for the Blind.

Stremmel-Campbell, K. & Guida, J. C. (1984). Communication placement assessment manual. Monmouth, OR: Teaching Research.

Walsh, S. R. & Holzberg, R. H. (1981). Understanding and educating the deaf-blind/severely and profoundly handicapped. Springfield, IL: Charles C. Thomas.

Wolery, M. (1983). Evaluating curricula: Purposes and strategies. Topics in Early Childhood Special Education, 2(4), 15-24.

THE SENSORIMOTOR PERIOD AND THE DEAF-BLIND CHILD

Overview of the Sensorimotor Period:

Educators generally agree that most children go through basic stages of development and that children's abilities are often evaluated on the basis of their achievement of observable milestones. How these behaviors are learned can be explained by applying a theory of intellectual development.

Progressivism is one ideology that is used in interpreting child development as well as in developing curriculum. This philosophical position combines other ideologies that believe 1) children do acquire skills sequentially and 2) environment and experience affect the acquisition of new skills. According to Progressivism, learning and development occur only when new information can be related to what the child already knows (Dunst, 1981). "Infant-curriculum designs developed from the Progressivism ideology are based primarily on Piagetian theory" (Dunst, 1981, p.16).

Piaget described intelligence as the process of adapting to allow effective interaction with the environment (Ginsburg & Opper, 1969). Beginning with a biological response to the environment, the child continuously organizes and reorganizes information.

Piaget used five formal criteria to explain the process of child development. Among these, equilibration was used to explain the process of the acquisition of knowledge (Dunst, 1981). Throughout this continuous process of using the environment to learn and learning to adjust to changes in the environment, the child adapts (Singer & Revenson, 1978).

Piaget felt that adaptation occurred as a result of two interrelated processes, assimilation and accommodation. Assimilation is the process of taking in new information and fitting it into a preconceived notion, while accommodation is the adjustment to new experiences by revising old plans to fit new information (Singer & Revenson, 1978). These processes, in turn, enabled the child to develop schemata. Schemata are defined by Piaget as simple mental images or patterns of action that enable a person to interpret things he sees, smells, touches, hears, and so on.

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This process is a continuing and spiraling one, that is, schemata are used to assimilate and accommodate new information, which in turn lead to the development of new and more complex schemata. Piaget theorized that all learning was based on the gradual attainment of information and that new knowledge was built on previous knowledge. Environmental experiences were an important part of that process.

Piaget also divided the learning or adaptation process into developmental periods from birth through adulthood. The first of those periods is the sensorimotor, normally experienced between birth and twenty-four months. He further divided this period into six substages. During this time, the infant moves from a neo-natal reflexive level (where he does not differentiate stimuli) to a representational level (where complex actions are used to interact with the environment).

In addition to developing this hierarchical developmental sequence, Piaget also described the development of sensorimotor intelligence in various domains. These domains, or branches of development, have been used to further describe the types of learning and intent of behaviors acquired in the sensorimotor period. The chart following this section provides an excellent overview of the behaviors observed in each domain of the sensorimotor stage.

Interaction with the environment is crucial during the sensorimotor period. The sensory information received during this time enables the child to develop behavioral schemata which are applied later at a more abstract and complex level. With these concepts in mind, consider the child who experiences one or more sensory deficits. Do children who fit into this category develop the same schemata that their sighted and hearing peers experience? What are the causes of the developmental lags that are frequently noted in children who have dual sensory impairments?

The Deaf-Blind Child

It is rare that children who are categorized as deaf-blind are both totally blind and profoundly hearing impaired. The term "deaf-blindness" applies to children who have deficits in both senses to an extent that they cannot be educated solely as deaf or as blind children (Federal Register, 1977). How much these children see and hear, and how much they use their residual senses differs with each individual. Yet, as individual as their sensory deficits are, many deaf-blind children have certain behaviors in common.

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These children have been observed to display the following atypical behaviors and developmental patterns within the cognitive, psychomotor, and affective domains (McInnes & Treffrey, 1882; Robbins, 1977):

Cognitive

*Severe developmental delay in cognitive processes resulting in additional labeling as mentally retarded.

*Lack of ability to communicate with persons in the environment in a meaningful way.

*Slow or no growth from the sensorimotor stage to preoperational, concrete operations, and formal operational stages.

*Extreme difficulty with abstract reasoning processes.

Psychomotor

*Poor body awareness, spatial relationships, and object permanence skills.

*Delayed fine and gross motor development. Atypical movement patterns, and, at times, some omission of certain motor milestones (e.g., creeping).

*Tactile defensiveness.

*Distorted perceptions of objects in the environment.

Affective

*Autistic-like behaviors: withdrawal from others, self stimulation, self abuse.

*Extreme difficulty in establishing and maintaining interpersonal relationships.

*Deprivation of many basic extrinsic motivations resulting in lack of interest in interacting with the environment.

Why do these atypical patterns of behavior occur? First, consider the importance of visual and auditory input on the development of children. In the first few months of life, the infant receives most of his stimulation from tactile, auditory, and visual sources. The baby cries and the mother comes into the room to pick him up. She softly calls the baby's name, turns on the light, picks up the child, and feeds him. The

child learns that when he hears mother and when the light comes on, he will be comforted. He assimilates this information and begins to understand that his crying brought mother into the room. Thus, the child develops causality.

In another instance, a wind-up musical mobile is placed above an infant lying in a crib. He watches and listens to it, gradually reaching out and manipulating it himself. He begins to develop more complex schemata to use in understanding object concepts, spatial relationships, and cause and effect relationships.

The deaf-blind child, however, does not receive the same sensory input that his sighted and hearing peers do. As a result, his assimilation and accommodation of new information may differ. Because he does not hear the mother's voice or perhaps see the light, the deaf-blind infant does not learn to pair the initial entrance of the mother with the comforting behavior. He may have to rely on the tactile cue alone. As a result, the infant may not establish communication and control over his environment until later. Or, as in the case of the mobile, because the child does not respond to the auditory and/or visual stimuli, he may not be motivated to reach out and manipulate the mobile.

Because of the lack of interest in objects, the child may continue with the same simple movement pattern. While these repetitive movements may be adapted and become more complex, they may also be more self-stimulatory. It is not unusual to see deaf-blind students who engage in finger flicking in front of the eyes, repeated rocking, twirling in place while standing, or licking or rubbing parts of the body. These activities can lead to an even greater lack of awareness in the environment outside of the child's immediate reach. The deaf-blind child then falls farther and farther behind his sighted and hearing peers in all educational and skill areas. He may become locked into the stage that Piaget described as sensorimotor and may not develop more abstract and complex processes.

Children need to develop systems of behavior in order to exert control over their environment. Without this development, they are constantly at the mercy of whatever is going on and cannot change or modify the effects of incoming stimulation (Hammer, 1972).

If educators can develop curriculum guidelines and instructional strategies which center on the systems of behavior which the child who is deaf-blind must develop

in order to cope with the environment, these children may be better able to move out of the sensorimotor period and develop into more independent, self controlled, and fulfilled adults.

References

Department of Health Education and Welfare. (1977). Education of handicapped children: Implementation of part B of the education of the handicapped act.(Federal Register, August 23). Washington, D.C.: U.S. Office of Education.

Dunst, C.J. (1981). Infant learning: A cognitive-linguistic intervention strategy. Hingham,MA: Teaching Resources Corporation.

Ginsburg, H. & Opper, S. (1969). Piaget's theory of intellectual development. Englewood Cliffs, NJ: Prentice Hall, Inc.

Hammer, E. (1972, March). What we know about deaf-blind children and early development. Paper presented at the 50th Annual Convention, Council for Exceptional Children.

McInnes, J.M. and Treffrey, J.A. (1982). Deaf-blind infants and children. Toronto: University of Toronto Press.

Robbins, N. (1977). Educational assessment of deaf-blind and auditorily-visually impaired children: A study. In E.L.Lowell & C.C. Rouin (Eds.), State of the art: Perspectives on serving deaf-blind children. (pp.108-142). Sacramento: Southwest Regional Center for Deaf-Blind.

Singer, D.G. & Revenson, J.H. (1978). A Piaget primer. New York: New American Library, Inc.

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Selected Characteristics of the Attainments of the Sensorimotor Period

Stages (Age in Months)	Domains of Sensorimotor Development: Purposeful Problem-Solving	Object Permanence	Spatial Relationships	Causality	Vocal Imitation	Gestural Imitation	Play
I Use of Reflexes (0 - 1)	Shows only reflexive reactions in response to external stimuli	No active search for objects vanishing from sight	No signs of appreciation of spatial relationships between objects	No signs of understanding causal relationships	Vocal contagion Cries upon hearing another infant cry	No signs of imitation of movements	No signs of intentional play behavior
II Primary Circular Reactions (1 - 4)	Adaptations first acquired coordination of two behavioral schemes (e g , hand-mouth coordination)	Attempts to maintain visual contact with objects moving outside the visual field	Reacts to external stimuli as representing independent spatial fields (visual, auditory, etc) rather than as a spatial nexus	Shows signs of precausal understanding (e g , places thumb in the mouth to suck on it)	Repeats sound just produced following adult imitation of the sound	Repeats movements just made following adult imitation of the action	Produces primary circular reactions repeatedly in an enjoyable manner
III Secondary Circular Reactions (4 - 8)	Procedures for making interesting sights last repeats actions to maintain the reinforcing consequences produced by the action	Reinstates visual contact with objects by (a) anticipating the terminal position of a moving object, and (b) removing a cloth placed over his/her face, retrieves a partially hidden object	Shows signs of understanding relationships between self and external events (e g , follows trajectory of rapidly falling objects)	Uses "phenomenalistic procedures" (e g , generalized excitement) as a causal action to have an adult repeat an interesting spectacle	Imitates sounds already in his/her repertoire	Imitates simple gestures already in his/her repertoire, which are visible to him/her	Repeats interesting actions applied to familiar objects
IV Coordination of Secondary Circular Reactions (8 - 12)	Serializes two heretofore separate behaviors in goal-directed sequences	Secures objects seen hidden under, behind, etc , a single barrier	Rotates and examines objects with signs of appreciation of their three-dimensional attributes: size, shape, weight, etc	Touches adult's hands to have that person instigate or continue an interesting game or action	Imitates novel sounds but only ones similar to those he/she already produces	Imitates (a) invisible movements made by self (e g , sticking out the tongue), and (b) novel movements composed of actions familiar to him/her	During problem-solving sequences, abandons the terminus in favor of playing with the means Ritualization applies appropriate social actions to different objects
V Tertiary Circular Reactions (12 - 18)	Discovers "novel" means behavior needed to obtain a desired goal	Secures objects hidden through a series of visible displacements	Combines and relates objects in different spatial configurations (e g , places blocks into a cup)	Hands an object to an adult to have that person repeat or instigate a desired action	Imitates novel sound patterns and words he/she has not previously heard	Imitates novel movements he/she cannot see self perform (i e , invisible gestures) and has not previously performed	Adaptative play begins to use one object (e g , doll cup) as a substitute for another (e g , adult sized cup) during play with objects
VI Representation and Foresight (18 - 24)	"Invents" means behavior, via internal thought processes, needed to obtain a desired goal	Recreates sequence of displacements to secure objects: secures objects hidden through a sequence of invisible displacements	Manifests the ability to "represent" the nature of spatial relationships existing between objects, and between objects and him-herself	Shows capacity to (a) infer a cause, given only its effect, and (b) foresee an effect, given a cause	Imitates complex verbalizations Reproduces previously heard sounds and words from memory deferred imitation	Imitates complex motor movements Reproduces previously observed actions from memory deferred imitation	Symbolic play uses one object as a "signifier" for another (e g , a box for a doll bed) Symbolically enacts an event without having ordinarily used objects present

From: Dunst, C.J. (1981). Infant Learning: A Cognitive-Linguistic Intervention Strategy. Hingham, Mass: Teaching Resources. p. 22

PART TWO

THE ADAPTATION PROCESS

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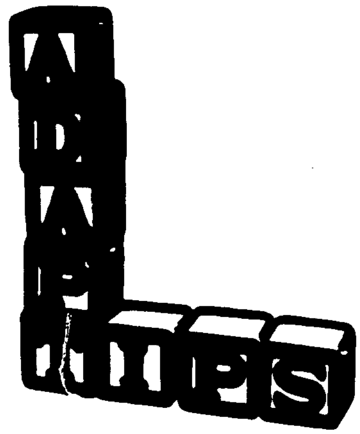

4

MAINTAIN & GENERALIZE NEW SKILLS

- Provide Opportunities for Generalization
- Continue To Criterion

3

IMPLEMENT ADAPTED ACTIVITY

- Provide Multisensory Exploration
- Provide Communication Cue
- Position Child
- Arrange Environment

2

PLAN FUNCTIONAL INDIVIDUALIZED PROGRAM

- Select Materials Student Responds To
- Decide Appropriate Communication Mode
- Describe Behaviors and Acceptable Response
- Select Functional Goals and Activity

1

COLLECT FUNCTIONAL ASSESSMENT DATA

- Complete Functional Sensory Assessments
- Collect Background Information

COLLECT FUNCTIONAL ASSESSMENT DATA

Collect Background Information

Before planning any educational goals, objectives, or intervention activities for a student, it is imperative that adequate background information be obtained.

Background information is any information that will help the teacher better interpret the student's behaviors, become aware of medical conditions that may affect the student's performance, or may have other implications in planning activities.

Medical and health related information should include the diagnosis, medical problems, and current medications, as well as results of the most recent audiological and ophthalmological examinations. A list of any reactions the child might have to materials, environmental conditions, movement, etc., should also be given. **A form to summarize medically related information is provided in Appendix C.**

Another important area is information related to child performance and response. Educational assessments, data from classroom instruction, and child observations are some sources that can be of assistance in selecting instructional goals for the student.

Complete Functional Sensory Screenings

When selecting and adapting activities from curricula for use with students who are deaf-blind or those who are severely handicapped, appropriate material selection can play an important role.

In order to select materials for use in intervention activities, the teacher must be able to identify the responses the student has to various types of sensory stimulation. This often includes interpreting atypical behaviors by deciding the intent of those behaviors.

Three sensory screenings in this manual have been designed to help teachers assess how the child responds to various types of sensory information. They are not designed to assess how well a child sees, hears, etc., but are intended to supplement other types of sensory screening tools and diagnostic information.

Copies of all functional sensory screenings and related background information forms can be found in Appendix C.

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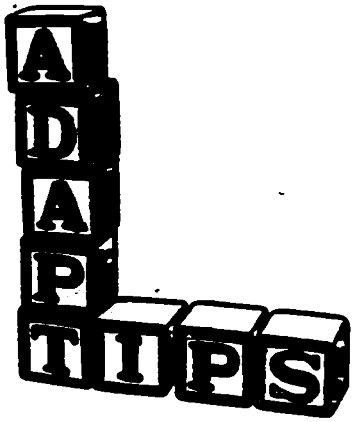
These Functional Sensory Screenings should assist the teacher in educational program development by identifying:

- the presence or absence of responses to different sensory stimuli;
- the characteristics of materials to which the child consistently responds within each sensory mode;
- the most consistent responses shown (eye widening, movement, etc.);
- the best position for the child, the best presentation of material (e.g. left, right, diagonal), and the most optimal environment; and
- deficits or questions which indicate a need for formal assessment.

Materials used for the assessments should be selected from the Categorization of Materials List included with the screenings. The Materials Bibliography (see Appendix B) may also be used to select specific materials or toys for use in an activity.

These Functional Sensory Screenings are an important planning tool in the curriculum adaptation process. If a teacher will take the time to administer them and use that information in combination with other suggestions given in the **Adaptip Process**, she or he should be able to plan more appropriate intervention activities that meet the needs of students who are deaf-blind.



1

COLLECT FUNCTIONAL ASSESSMENT DATA

- Complete Functional Sensory Assessments
- Collect Background Information

2

PLAN FUNCTIONAL INDIVIDUALIZED PROGRAM

- Select Materials Student Responds To
- Decide Appropriate Communication Mode
- Describe Behaviors and Acceptable Responses
- Select Functional Goals and Activity

3

IMPLEMENT ADAPTED ACTIVITY

- Provide Multisensory Exploration
- Provide Communication Cue
- Position Child
- Arrange Environment

4

MAINTAIN & GENERALIZE NEW SKILLS

- Provide Opportunities for Generalization
- Continue To Criterion

PLAN FUNCTIONAL INDIVIDUALIZED PROGRAM

Select Appropriate Functional Goals and Activity

When considering the child's priorities for educational programming, place highest priority on teaching skills that will lead to functional behaviors in the natural environment. A functional behavior is one that can be of use in real life situations. Consideration should be given to the age-appropriateness of the activities and materials selected.

For example, Melissa, an eighteen month old, physically involved girl, appeared to be very passive and non-interactive in her environment. During the sensory screenings, she did not respond to any visual materials, but did quiet to sound and tactile sensation of the Frog Chorus toy.

After evaluation one of the activity plans developed was the following:

Behavior	Domains	Functional Goals
When tactilely presented with the frog chorus, Melissa will search for the toy and repeatedly press the keys.	object permanence, causality, & means-ends	-independent feeding -environmental exploration

Describe Behavior and Acceptable Response

In most cases, the acceptable response for the activity will be the one described in the curriculum. However, if a child cannot elicit that response but, in fact, is able to understand the concept or intent of the activity, you may want to make an adaptation in describing the acceptable response.

For example, most children will physically try to manipulate an adult's hand to activate a toy that they do not have the skill to do yet. A child who is physically disabled may not be able to do that. An acceptable response for that child might be "looks at toy, then to adult, then back to toy".

When selecting acceptable responses, make sure that the response is one that can be made and that it is a logical one in response to the given activity. The sensory screenings and the student background information sheet should provide you with examples of responses for a particular child.

Decide Appropriate Communication Mode

Selecting the appropriate communication mode to accompany the presentation of activities can be a critical factor in having the student understand the intent of an activity.

Communication implies a two-way process. If we talk in English to a person who does not understand that language, then communication does not occur. The same is true when we use a form of communication that has no meaning with a child who is deaf-blind.

Sign language has become an accepted form of communication with persons who experience hearing impairments and who are non-verbal. However, to understand sign language, a hearing impaired person must have the ability to understand an abstract symbol system. When a child experiences severe developmental delays and is functioning at a more concrete level, sign language may not be an appropriate form of communication.

Students who are deaf-blind and functioning within the sensorimotor stage of development may have communication skills at any of the following levels of decreasing abstraction:

***Signs:** Signing involves the use of manually presented words or concepts. The student who is deaf-blind must be cognitively ready to understand this abstract system in the same manner that a sighted and hearing child would have to be cognitively ready to understand the spoken word. Many times children who have sensory losses will imitate signs and will even respond appropriately to a given request. It is possible, though, that some of these students are responding to a familiar situation or routine, rather than the signs. This is especially true when a student is chronologically older but still functioning within the sensorimotor developmental period.

***REBUS Symbols (Pictographs):** REBUS Symbols are a symbol system in which simple line drawing pictures are used to present words or concepts."These symbols can be concrete (picture drawings that directly resemble the object), relational (position in space relates to the concept), and abstract (no apparent relation to the concept or words they represent)" (Sims-Tucker & Jensema,1983,p.306).

***Natural Gestures:** Natural gestures are used by most children before they learn to speak. For example, if a child wants a drink of water, he may point to the

cupboard where the glasses are kept. If a child continually communicated in this fashion, we would say he had a "natural gesture language system". Students who communicate with natural gestures are usually functioning cognitively at a lower level than students who use and/or understand REBUS or formal signs.

***Symbols (Representational)**: This level of communication involves the use of objects or pictures that represent an activity or command. In one training activity, a sixteen year old student who had never used or appeared to understand signs, was able to complete simple routines after being given an object that represented the activity. In one activity, a small rubber ball was used to give the command "Go to the gym." Prior to using the symbols for communication, this young man had to be prompted through the routine. Following the training, he was able to walk independently to the gym while holding the small ball as a reminder of what was being expected of him.

***Functional Objects (Actual Items)**: At a more basic level, real objects can be used in much the same way that representational objects were used in the section above. In a study by Taylor (1984), a deaf-blind young woman was taught to prepare simple foods by using tactile recipe cards. Because of her cognitive functioning level, real objects were placed on the cards, then sequenced correctly for her to follow. In one activity, she prepared a bowl of cereal by feeling the first card, that had a bowl glued onto it; getting a bowl from the cupboard; feeling a small box of cereal on the next card; getting a similar box, opening it, pouring it in the bowl; and so on until the cereal was prepared. Prior to training, this person required continual prompting to complete the activity, even though it was a familiar one.

***Anticipatory Responses**: At this level of communication, the child begins to recognize that she or he can have an effect on people and things in the environment (Oregon Dept. of Education, 1983). Many children who are deaf-blind and experience other disabilities exhibit communication at this level. For example, a child who had cerebral palsy and was also hearing and visually impaired went into extension when a familiar person approached. This extension indicated that the child anticipated that he was about to be picked up.

***Reflexive/Direct Responses**: "The activity level of the body is a strong indicator of the intensity of affective states" (Dil, 1984, p.96). At this level, the student responds primarily to direct stimulation and

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does not exhibit any anticipatory behaviors. For example, a child may widen the eyes and smile when a toy is presented but does not seem to be aware of the toy either before or after the activity.

In selecting the appropriate communication mode to use with any student, an assessment of language skills must be made. Some assessments that include evaluation of non-verbal language in the sensorimotor period are the Gestural Approach to Thought and Expression (GATE)(Langley, 1980), Communication Placement Assessment Manual (Stremel-Campbell & Guida, 1984), and Nonverbal Prelinguistic Communication, (Oregon Department of Education, 1983).

In addition, many programs have developed their own screening tools which include a language assessment for persons who are deaf-blind or severely/profoundly handicapped.

When adapting curriculum activities for a child who is visually and hearing impaired, make sure the appropriate communication mode is selected to accompany the activity. Use a total communication approach (speech and nonverbal communication) that is appropriate for the student's current level of functioning.

Select Materials Student Responds To

The materials you select should be those that are appropriate for the activity as well as having sensory characteristics to which the child responds.

For example, if you want a student with low vision to learn to find a comb in a drawer (a functional goal using problem solving), you would want to encourage visual searching skills. If the child had responded to the category of "brightly colored materials", you might want to use a yellow comb set on a black paper drawer liner for high visual contrast.

References

Dil, N.(1984). Nonverbal communication in young children.Topics in Early Childhood Special Education. 4(2), 82-99.

Langley,M.B.(1980). Gestural approach to thought and expression (GATE): An index of nonverbal communication and its critical prerequisites. (Available from M.Beth Langley, Nina Harris

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Exceptional Student Center, 6000 70th Ave. North, Pinellas Park, Florida, 33565).

Nonverbal prelinguistic communication: A guide to communication levels in prelinguistic handicapped children.(1983). Salem, OR: Oregon Department of Education.

Silverrain, Ann.(1983). The use of symbol shelves in teaching communication with multihandicapped children. The National Newspatch. Spring, 1-5.

Sims-Tucker, B.M. & Jensema, C.K. (1983). Severely and profoundly auditorially/visually impaired students. In P.J. Valletutti and B.M. Sims-Tucker (Eds.),Severely and profoundly handicapped students: Their nature and needs (pp 269-308). Baltimore: Paul Brookes.

Stremel-Campbell, K. & Guida, J.C.(1984). Communication placement assessment manual.Monmouth, OR: Teaching Research.

Taylor, R.G.(1984, November).Teaching a severely handicapped, deaf-blind adult to prepare breakfast food by following tactile recipe cards. Paper presented at the meeting of the Association of Severely Handicapped, Chicago, IL.

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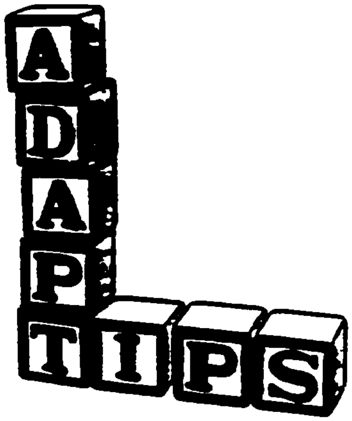

4

MAINTAIN & GENERALIZE NEW SKILLS

- Provide Opportunities for Generalization
- Continue To Criterion

3

IMPLEMENT ADAPTED ACTIVITY

- Provide Multisensory Exploration
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2

PLAN FUNCTIONAL INDIVIDUALIZED PROGRAM

- Select Materials Student Responds To
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1

COLLECT FUNCTIONAL ASSESSMENT DATA

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IMPLEMENT ADAPTED ACTIVITY

Arrange Environment

Before implementing any activity, arrange the instructional area. While you want the child to learn in the most natural and environment to facilitate later generalization, it may be necessary to arrange the instructional area to minimize distractions and increase attention to the task.

For example, if a student is distracted by light from windows and has a tendency to self-stimulate when seated by them, you may want to move the desk so that the light is behind the chair or even cover the window with a shade.

Position Child

Positioning can be a critical factor in how a child responds to an activity. Children who are profoundly handicapped or experience physical disabilities may not do as well in "traditional" positions as in adapted ones.

For children who are spastic or have poor head control, sitting in a chair may be very strenuous. If the child puts all of his or her energy into trying to keep the head upright, it will be more difficult to concentrate on the activity itself. A more appropriate position for that child might be sidelying. This position allows the child who is spastic to relax and provides support for the floppy child.

A physical therapist or occupational therapist should be consulted whenever there are questions about the most appropriate position for an activity.

Provide Communication Cue

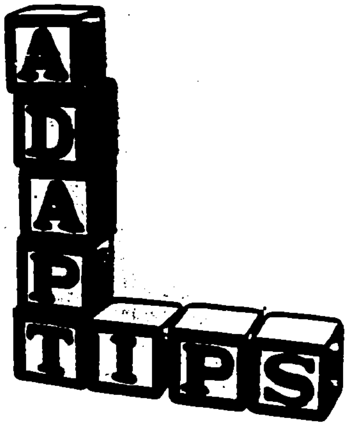
An objective for any instructional activity is to have the student understand what is expected of him or her. Combining a communication cue with other prompts can facilitate anticipation and understanding of a task.

The communication cue should be at the language level of the child. The nonverbal levels that are suggested in this manual are:

Signs
Rebus Symbols
Natural Gestures
Representational Symbols
Functional Objects
Prompts That Are Part of the Activity

Provide Multisensory Exploration

Provide opportunity for tactile/sensory exploration of the target object (material) before presenting the task. Allow the child ten seconds to explore the sensory features of the object (visual, auditory, tactiles, kinesthetic, gustatory, and olfactory). If necessary, physically guide the student through the exploration, using a position that is natural to the child (e.g., teacher sits behind the child and provides hand over hand assistance). Present the task immediately afterwards.



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COLLECT FUNCTIONAL ASSESSMENT DATA

- Complete Functional Sensory Assessments
- Collect Background Information

MAINTAIN AND GENERALIZE NEW SKILLS

Continue to Criterion:

Once the activity has been implemented and appears to be appropriate for the student, plan an instructional schedule that will provide ample opportunity for the student to reach criterion for mastery of the task.

Collecting data on both student performance and conditions related to that performance can provide the teacher with information to use in further modifying activities as needed. There are many excellent resources available for teachers on collecting data in the classroom.

Provide Opportunities for Generalization

Once a skill has been successfully taught, it is important to provide numerous opportunities for generalization. Generalization of a skill means that the student shows understanding or can perform the activity in the natural environmental context and without prompting.

Sometimes, students who are deaf-blind will reach criterion on many tasks. They perform these tasks well in the instructional environment. However, when left alone with the materials for an activity, these same students don't appear to be interested. For example, one teenage boy was taught to place headphones on, put an eight-track audio tape into a player, and adjust the volume to listen to music. Even though he successfully reached criterion in the instructional setting and appeared to enjoy the music, he did not initiate the activity during leisure time in his group home.

In order to encourage him to use this functional skill, the group home managers initiated a program within the home that was similar to the instructional program. Whenever the teenager had some leisure time, he was encouraged to listen to the tape player. Within a few days, the student was going to the tape player and listening to his favorite tunes rather than sitting on the floor and rocking.

For any instructional program to be successful, it is important to arrange opportunities for the student to use his or her new skills in a natural setting. If these opportunities cannot be arranged within the educational setting, then plans should be made to continue the activities in the environment that will best facilitate generalization.

PART THREE

EXAMPLES OF ADAPTED ACTIVITIES

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MEANS ENDS/CAUSALITY

These two domains of cognitive development are closely related. Means-ends behaviors are concerned with the recognition and attainment of goals. The child is concerned with what needs to be done (means) to achieve a goal (ends). For example, a child may want to open a screen door where the latch is out of reach. He gets a broom and uses it to push the hook out of the eye and opens the door.

Causality relates to the perception that oneself or other people can affect change in the environment. In the causality sequence, the child learns to actively search for the behavior required to create any effect. For example, a student may put the teacher's hand on a tape recorder to get the teacher to turn on the music.

Both domains progress from simple awareness of self (e.g., hand watching) to purposeful problem solving.

Because the sensory information being received is incomplete in children who are deaf-blind, misperceptions of the world and confusion about situations occur. As a result, the organization of thought necessary for more abstract problem solving may not occur.

The following examples are examples of behaviors that were from the North Carolina Curriculum for Handicapped Infants and Children: Field Test Edition and used in the field testing of adaptations by the Curriculum Adaptations for the Deaf-Blind Project. Revised Curriculum activities are followed by an example of an adaptation.

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AREA: Control Over Physical Environment (Means-Ends, Causality)

BEHAVIOR: Repeats activity which produces an interesting result.

MEASUREMENT: Repeats action to produce a result. Record number of repetitions during one minute, give 10 trials.

POSITION: Any position that allows maximum use of limbs.

MATERIALS: A variety of "responsive" toys, (e.g., roly poly chimes, crib mobiles, bells, squeaky toys very soft rubber).

ACTIVITY: Present responsive toy to child within his reach. Observe and record number of arm and/or leg movements with toy present during a one minute period. If there is no rate increase, try attaching a string to the child's wrist or ankle to a mobile or toy. Observe and record for one minute again.

<u>To Adapt Activity</u>:

1. Select material from Categories of Materials list to which the child demonstrates a response. Select a behavior that is within the child's physical capability.
2. Provide multisensory exploration.
3. Present activity.
4. Observe response. Record.

<u>Example of Adapted Activity</u>

Category/Material: Vestibular/Rocking Board

Environment/Position: In classroom or gym, place Dan in sidelying position on cushioned surface of a rocker board.

Behavior: After being rocked gently on rocker board, Dan will vocalize and move free arm to indicate he wants more rocking.

Activity: Place Dan on a rocking board in sidelying position (to reduce spasticity and facilitate arm movement). Give communication cue and rock the board gently. When Dan vocalizes, prompt him to also move arm. Then rock board again.

Multisensory Exploration: Before beginning activity, sit on floor with Dan seated in a supported and somewhat flexed position between your legs. Make a rocking motion with him. Next, sit on rocking board with your feet on ground and child between legs. Rock gently and make "ahh" sound. Have child put arms out and touch rocking board.

Communication Cue (Reflexive/Responsive): Multisensory exploration is part of communication cue.

AREA: Control Over Physical Environment (Means-Ends, Causality)

BEHAVIOR: Uses a simple tool to obtain an object or effect.

MEASUREMENT: Spontaneously uses a tool to obtain a desired object or effect <u>without</u> demonstration. Give 10 trials.

POSITION: Any position which facilitates movement.

MATERIALS: Desired toys.

ACTIVITY: Place the toy with string attached out of the child's reach, but with the string within his reach. Observe and record. For motor impaired, assess what motor acts the child can perform and determine what tool use can be encouraged. The child's only usable tool may be the adult working with him.

<u>To Adapt Activity</u>:

1. Select material from the Categorization of Materials List to which the child demonstrates a response. Select a behavior that is within the child's physical capability. Attached tools may include a string with a bead attached to the end that the child will grasp, a cloth or towel, or a blanket that the child and object are on top of.
2. Provide multisensory exploration of the target object and the tool to which it is attached at each trial.
3. Present activity.
4. Observe response. Record.

<u>Example of Adapted Activity</u>

Category/Material: Auditory noisemaker; Visual, illuminated/Fisher Price pull xylophone adapted by substituting fluorescent nylon rope and large bead for string pull.

Environment/Position: Darkened room, child seated at table with arms free and on table.

Behavior: Betty will grasp a string that is attached to a musical toy and pull it towards her to activate it.

Activity: Place Betty at a table with her arms on the surface. Place the xylophone on the table out of reach. Have the string extended so that the bead is within reach. Dim room lights and turn on blacklight. Provide communication cue and prompt as needed until she pulls xylophone forward.

Multisensory Exploration: Before activity, guide Betty in touching xylophone and in pulling it towards her until it is activated. Repeat with blacklight illumination.

Communication Cue (Natural Gesture): Place a short piece of the same type of string with a bead attached in Betty's hand. Guide her hand and arm in a pulling motion. Say "Get the toy, Betty."

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AREA:	Control Over Physical Environment (Means-Ends, Causality)
BEHAVIOR:	Uses tools to solve problems.
MEASUREMENT:	Spontaneously uses a tool to solve a problem solved, given 10 trials.
POSITION:	Any position which facilitates movement in a normal household or classroom environment.
MATERIALS:	Toys and objects which can be used as tools, (e.g., small broom, coat hanger, etc.).
ACTIVITY:	Set up a situation where an object is out of reach and a tool is available, (ball under a couch, object too high to reach). Observe and record if the child can make use of the tool, to get the object.

<u>To Adapt Activity</u>:

1. Select material from Categorization of Materials list to which the child demonstrates a response. Select a behavior within the child's physical capability. Tools may be categorized as related and unrelated.
   Related tools may include: utensil for eating, keys to toy - keys to learning, play fish and magnetic or velcro fishing pole
   Unrelated tools may include: a stick, a shovel, a chair, a toy rake
2. Provide multisensory exploration of each object and tool. Conduct this activity in an area where the child is familiar with the furniture arrangement and placement of objects.
3. Present activity.
4. Observe response. Record.

<u>Example of Adapted Activity</u>

Catergory/Material: Noisemaker, Auditory; High contrast, Visual/Play fishing pole with velcro "hook", black felt "fish" with bells sewn on.

Environment/Position: In classroom or home. Place felt fish in a box that is chest high to child.

Behavior: Mark will be able to obtain felt fish from a box by lowering the line and "hooking" the fish with the velcro fabric.

Activity: Place 4 black felt fish shapes with bells on them in the bottom of the box. Ask Mark to "get the fish". Have the fishing pole within vision range or in a familiar location. Do not physically prompt him to pick up the pole as this is an activity requiring problem solving.

Multisensory Exploration: Before you start the activity show Mark the fish. Let him visually, tactilely and auditorily explore them. Let him watch you as you put the fish in the box.

Communication Cue (Sign and Rebus): At the beginning of the activity, give Mark a card with the REBUS for "fishing" (pole outline with fish dangling) and sign "get fish."

SPATIAL RELATIONS

The child who drops food on the floor, and then looks over his tray to see where it has fallen is exploring spatial relations. Shifting gaze between objects, localizing sound, stacking blocks, or physically moving around barriers leads to an understanding of the relationships between oneself, objects, and space.

The perception of one's body and its relationship to space and other objects is different for the child who is blind. If deafness is added to this altered perception, the child must rely primarily on the sense of touch to explore the properties of objects and space. There is little motivation to explore the environment and encounter unexpected events. Consequently, mobility, a critical skill for independence, is delayed.

The following examples are examples of behaviors that were from the North Carolina Curriculum for Handicapped Infants and Children: Field Test Edition and used in the field testing of adaptations by the Curriculum Adaptations for the Deaf-Blind Project. Revised Curriculum activities are followed by an example of an adaptation.

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AREA: Spatial Concepts

BEHAVIOR: Looks for or reaches toward objects that touch the body in sight.

MEASUREMENT: Looks at object or reaches for it within 10 seconds after it initially touches him, give 10 trials.

POSITION: Held on caretaker's lap, in infant seat, or any position that will facilitate head turning or hand use.

MATERIALS: Objects with a variety of textures, colors and shapes, (e.g., sponge, toothbrush, warm cloth, as well as toys).

ACTIVITY: Touch the child's body (hand, leg) with the object outside of his direct line of vision but where he could easily see it. Observe to see if he looks at it and record.

<u>To Adapt Activity</u>:

1. Select material from the Categorization of Materials List to which the child demonstrates a response. Consider visual and other qualities (olfactory, tactile, auditory, etc.), when applicable. Select a position that is comfortable for the child, (e.g., side lying) that will facilitate looking or reaching.
2. Present multisensory exploration of the object manually and on various body parts.
3. Present activity. When the child responds by looking for the object or reaching, guide the child to touch that body part to facilitate body awareness.
4. Observe response. Record.

<u>Example of Adapted Activities</u>

Category/Material: Visual; lighted/tensor lamp, Tactile; vibratory/battery vibrator

Environment/Position: darkened room/side lying

Behavior: When tactile stimulation is applied to Bernetta's foot while a light is shining on her foot, Bernetta will look at her foot.

Activity: Shine the light on Bernetta's foot. Apply tactile stimulation with the vibrator to her foot for a few seconds. Wait for a response. Repeat.

Multisensory Exploration: Guide Bernetta to feel the vibrator with her hands, then apply vibratory stimulation to her foot. Guide her to look at her hands, then her foot.

Communication Cue (Anticipatory Response): Touch Bernetta's hands with your hands, present the vibrator. Touch her foot with your hand, then touch her foot with the vibrator. Conduct communication cue and multisensory exploration simultaneously.

Note: This example pairs two stimuli to facilitate the desired response, looking or reaching. When Bernetta has mastered looking or reaching toward paired stimuli, reduce the stimuli to one (e.g., looks at or reaches for her foot when tactile stimulation is applied).

AREA: Spatial Concepts

BEHAVIOR: Looks or reaches for objects which fall quietly from view.

MEASUREMENT: Looks or reaches for an object when it drops quietly from sight, give 10 trials.

POSITION: Any position which facilitates looking.

MATERIALS: Objects that have bright visual qualities (Nerf ball, stuffed toy) that make noise when dropped. Vary the objects used and note those objects that are interesting enough to gain his attention.

ACTIVITY: Hold the object at eye level, make sure the child's attention is focused on the item. Drop the item from view. Observe to see if the child attends to and follows the dropped object with visual search for it. Look for movement of the eyes with or without head movement which would indicate searching activity, record. Vary the objects used and the positions from which the objects are dropped.

To Adapt Activity:

1. Select material from Categorization of Materials List to which the child demonstrates a response. Behaviors that the child might perform to search for the lost object are visual searching, reaching for, or simply a grasping response. If the child exhibits a grasping response, try placing the object initially in contact with the child (drop it next to his foot or place it next to his forearm), then gradually move the object further away.

2. Provide multisensory exploration of the object at each trial. Guide tactile exploration of the area in which the activity is conducted. Initially, use well defined boundaries (e.g., playpen, tray, etc.).

3. Present activity. For the child who does not use vision to locate a lost object, provide tactile guidance of where the object is placed. Remove child's hand from the object. Does the child search for the object?

4. Observe response. Record.

Example of Adapted Activity

Category/Material: Tactile; familiar object/spoon, Gustatory; desired food/(e.g., yogurt).

Environment/Position: Familiar environment/seated in chair for snack.

Behavior: After a bite of a desired food, Margaret will reach for more.

Activity: Fill the spoon with yogurt, give Margaret a bite and then move the spoon away. Wait to see if Margaret reaches or searches with her hands to find the spoon and get another bite.

Multisensory Exploration: Guide Margaret to reach out to where you will hold the spoonful of yogurt and allow her to taste it.

Communication Cue (functional object/sign): Tactilely sign "eat," then present Margaret with the spoon.

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AREA: Spatial Concepts

BEHAVIOR: Reaches object from behind barrier.

MEASUREMENT: Reaches object from behind barrier, without demonstration, give 10 trials

POSITION: Any position which facilitates use of arms and hands.

MATERIALS: Any object which the child is particularly fond of. A variety of barriers available in the environment (example: partially opened door).

ACTIVITY: Show the toy to the child being sure he is interested in it. While he is watching, hide the object behind a barrier close enough that he can reach behind it. Observe to see if the child can spontaneously reach around the barrier to get the object, record.

<u>To Adapt Activity</u>:

1. Select material from Categorization of Materials List to which the child demonstrates a response. Select a barrier that the child can overcome. Barriers may include a half opened drawer, another person, the teacher's hand, or a toy box that requires reaching over (Dunst, 1983).
2. Provide multisensory exploration of the target object, the placement of it, and the barrier. Conduct this activity in an area where the child is familiar.
3. Present activity.
4. Observe response. Record.

<u>Example of Adapted Activity</u>

Category/Material: Tactile; familiar barrier, Auditory; noisemaker/friction fire truck with siren.

Environment/Position: Familiar environment/seated on floor.

Behavior: After cooperative (teacher and child) pushing of the fire truck, Justin will reach around the chair (or table, bed, etc.) when it rolls away.

Activity: Conduct this activity where room arrangement is familiar.

Cooperatively (teacher and child) push the fire truck around the floor and then allow it to roll away behind the chair (the barrier). Observe Justin to see if he searches where the truck rolled (auditory localization) and reaches or moves around the chair to find it and resume play (spatial awareness).

Multisensory Exploration: Guide Justin to explore the area where the chair is (the barrier) and to the fire truck.

Communication Cue (Sign): Tactilely sign and say "fire truck," then present the truck to Justin.

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OBJECT PERMANENCE

Awareness that an object exists, although out of view, is a concept of object permanence.

The infant first becomes visually aware of objects and people, then progresses to visual tracking. As behaviors of object permanence become more complex, the child must use memory, persistence, and the ability to problem solve as he searches for hidden objects.

Children who are sensorily impaired must rely on their remaining senses to gain knowledge about the existence of objects and people in their environment. Based on the work of Selma Fraiberg (1977), Langley (1980) has proposed an auditory and tactile progression of object permanence.

The Developmental Progression of Pursuit and Permanence of Objects in the Blind Infant: Touch Versus Sound

Chronological Age	Touch Cue	Sound Cue
6-7 months	When a toy is removed from the child's hands, the action of the hands briefly continues. A toy touched to the hand activates a grasping response.	The sound of a toy elicits alertness but no orientation of the head to the sound source. A sound elicits no motion of the infant's hands.
7-8 months	When a toy is removed from the child's grasp, rudimentary behavior occasionally occurs. The hand moves randomly across the place where contact was lost. The search is brief and unsystematic. A chance encounter with the toy elicits grasping behavior.	If a toy is removed from a child's grasp prior to the activation of its sound, searching movements will not occur when the sound is turned on, but the hand will open and close. Isolated instances of head turning toward the sound can now be observed. There is no use of sound to track or locate a toy.
8-11 months	Frequent intentional reaching occurs in the locale where the infant lost contact with the toy.	If the toy makes sounds, the infant can occasionally find its location through its sound cue. The fingers move to the sound cue alone. No searching is observed.
11-13 months	Search patterns now take into account the place where the lost object had been tactually experienced.	The infant reaches directly to the sound cue alone. The infant pursues an out of reach object on the basis of the sound cue alone.

Adapted from Fraiberg, S. Insights from the blind. New York: Basic Books, 1977.

Environments, routines, and storage of familiar objects that are consistent should benefit the deaf-blind child as he develops an understanding of object permanence concepts.

Presented are three categories of adaptations for Object Permanence curriculum activities. They are:

1. Adaptations of Visual Pursuit/Object Permanence (from Carolina Curriculum)

2. Adaptations of Auditory Localization/Object Permanence (from Carolina Curriculum)

3. Adaptations for Tactile Location of Objects/Object Permanence (based upon the work of Langley in the Teachable Moment and the Handicapped Infant)

Teachers may also consider using materials with features representing a combination of sensory characteristics (e.g., a brightly colored tactilely interesting squeaker toy such as the orange hedgehog). Consideration might also be given to developing object permanence activities that tap the child's olfactory sense. For example, when presented with a plate of warm cookies from the oven, the child searches for and locates the plate of cookies.

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Tactile Location of Objects/Object Permanence Sequence of Behaviors

a. When desired object is removed from the child's hands, the action of the hands briefly continues (e.g., hand stiff - formed as if to grasp a ball)

b. When a desired object is touched to the child's hand, the child responds by grasping.

c. When desired object is removed from the child's grasp, his hand moves randomly across the place where contact was lost.

d. When the child has lost contact with desired object, he begins to search for it by frequent intentional reaching in the area where he lost contact.

e. When the child has lost contact with a desired object, he searches for it in places where the missing object was tactilely experienced.

Following, are examples of how a teacher might present object permanence activities using tactile materials.

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AREA: Visual Pursuit/Object Permanence

BEHAVIOR: Finds toy hidden under a second cover.

MEASUREMENT: Gets a toy hidden under the second cover, given 10 trials.

POSITION: Any to facilitate reaching and grasping.

MATERIALS: A variety of different covers (scarves, pan lids, box tops, etc.) and a variety of interesting toys.

ACTIVITY: Hide a toy under one cover, when the child uncovers it, introduce a second cover a few inches away from the first. Take the toy and hide it under the second cover to find it without trying the first cover. Vary the side to which the second cover is introduced. Observe and record.

To Adapt Activity:

1. Select a visual material to which the child demonstrates a response. Select a cover that the child can remove. Select a position to facilitate the desired response.
2. Guide multisensory exploration of the object, each of the two covers and the placement of the object. Using total communication, identify the object before and after tactile exploration. Conduct this in a well defined area, such as on a tray.
3. Present the activity. Ask "Where's ______?" using total communication.
4. Observe response. Record.

Example of Adapted Activity

Category/Material: Visual; illuminated by blacklight/fluorescent puppet, two white towels (covers).

Environment/Position: Seated at table in a darkened room, tray with sheet of black paper on surface for contrast.

Behavior: Same.

Activity: Gradually darken room. Say and tactilely sign "look," then hide the puppet under one cover, while Don watches. Tactilely sign and ask "Where's ______?" Allow him to play with the puppet for a few seconds after he finds it. Then repeat the sequence using the second cover.

Multisensory Exploration: Guide multisensory exploration of the fluorescent puppet, the covers, and the tray area.

Communication Cue (Sign): Tactilely sign and say the puppets name or an appropriate label, then present the puppet to Don.

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AREA: Auditory Localization/Object Permanence

BEHAVIOR: Searches for an object on either side after it no longer makes noise (for visually impaired children).

MEASUREMENT: Searches for an object on either side after it no longer makes noise, given 10 trials.

POSITION: Any position which maximizes head control and reaching.

MATERIALS: Noisy toys.

ACTIVITY: Make a noise briefly to one side at waist level and wait for the child to reach. If not, make the sound a little longer, stop, and again wait. Continue increasing the duration of the sound until he does reach, but always stop the sound before he actually touches the toy. Observe and record his response. For visually impaired children, a response that indicates the child knows the toy is there, although it can no longer be heard.

To Adapt Activity:

1. Select an auditory material to which the child has responded. Select a position to facilitate reaching.
2. Give multisensory exploration for each object prior to presentation.
3. Present the activity. Try objects presented closer to the child and at a higher [illegible] level. If a response is seen with other sensory cues, try going back and using auditory alone.
4. Observe response. Record.

Example for Adapted Activity

Sensory Material: Auditory; tactile/Battery operated Big-Mouth Singers.

Environment/Position: Familiar environment/prone on floor.

Behavior: Same.

Activity: Place the toy within reach to one side of Marcia and press the keys to activate the sound and stop. Wait for her to reach. If she doesn't reach, make the sound longer, stop, and wait. Gradually increase the sound until she does reach, but always stop the sound before she actually touches the toy.

Multisensory Exploration: Guide Marcia to tactilely explore the Big-Mouth Singers and press the keys to make a sound.

Communication Cue (Sign): Tactilely sign and say an appropriate direction, (e.g., "Play music,") then allow Marcia to explore the toy.

AREA: Tactile Location of Objects/Object Permanence

BEHAVIOR: When a desired object is touched to the child's hand, the child responds by grasping.

MEASUREMENT: Toy touched to the child's hand activates a grasping response. Give 10 trials.

POSITION: Any that maximizes stability to use upper limbs. The child may be placed in an infant seat, on the floor, or may be held in a caretaker's lap.

MATERIALS: Select tactile materials to which the child has shown an interest. Examples include vibratory materials (e.g., battery operataor vibrator), tactilely interesting plastic toys (e.g., hedge hogs), familiar objects (e.g., a hairbrush).

ENVIRONMENT: Conduct this activity in a familiar environment free from distractions.

Activity: Present the hedgehog to Betty Jo's hands. If necessary, guide her to explore the toy tactilely. Take the toy away from her hands. Wait a few seconds and then touch the object to the back of her fingers. Observe for a grasping response. Record.

Communication Cue (Anticipatory): Before presenting the hedgehog to Betty Jo, touch her hand with your hand and say "Play, Betty Jo" or any appropriate direction.

Multisensory Exploration: Guide Betty Jo to manually explore the hedgehog for 15 seconds prior to each trial.

AREA: Tactile Location of Objects/Object Permanence

BEHAVIOR: When the child has lost contact with a desired object, he searches for it in places where the object was tactilely experienced.

MEASUREMENT: After child loses contact, he reaches back to the place where he had it previously, but when he finds it it no longer is there, searches to find it in a different area and finds it. Give 10 trials.

POSITION: Any that facilitates desired response.

MATERIALS: Select tactile materials to which the child has shown an interest. Examples include vibratory materials (e.g., battery operated vibrator), tactilely interesting plastic toys (e.g., Bristle Blocks), familiar objects (e.g., a hairbrush).

ENVIRONMENT: Conduct this activity in a familiar environment that is free from distractions and has well-defined boundaries. Initially, this activity could be conducted on a tray with raised edges.

Activity: Present David with the communication cue, then guide multisensory exploration of the hairbrush and tray area. After David has picked up the brush and is holding it, take it away and quietly place it in another spot on the tray. Wait a few seconds. Tactilely sign "Where is the brush?" Look for him to reach directly where he last found the brush and not finding it, searches for it until he finds it. If he does not find it, physically guide him to search around the tray area. Reduce prompts. Record response.

Communication Cue (functional object/tactile sign): Tactilely sign "hairbrush," then present the brush to David.

Multisensory Exploration: Guide David to manually explore the hairbrush and then brush his hair for a few seconds. Guide him to explore the tray area.

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SCHEMES FOR RELATING TO OBJECTS

The sequence of development of schemes is simple--> complex--> social. Simple schemes are those in which the child performs the same action repeatedly. For example, a child at this level might bang his hand on any toy presented.

Complex schemes involve combined actions. These schemes tend to be in response to various properties of the object at hand. For example, a child may shake and bang a rattle but rub and pat a stuffed animal. If that child was using simple schemes, he would only bang, or only pat, etc. regardless of the object.

Social schemes are developed as representational behavior is developed. These schemes are found in play. A child who holds a toy phone to his ear is using a social imitative scheme. At a more abstract level, a child might hold a rattle or stick to his ear as if it was the phone.

Children who have sensory deficits may not develop schema in the same manner as their non-sensorily handicapped peers. A child who does not see may not be motivated to reach out and bat at a mobile. Another child might exhibit rocking or swaying and become "locked into" those rather than exploring the environment with more complex or social schema.

The following examples are examples of behaviors that were from the North Carolina Curriculum for Handicapped Infants and Children: Field Test Edition and used in the field testing of adaptations by the Curriculum Adaptations for the Deaf-Blind Project. Revised Curriculum activities are followed by an example of an adaptation.

AREA: Functional Use of Objects and Symbolic Play (Schemes)

BEHAVIOR: Moves hand to mouth.

POSITION: Any position which facilitates movement in upper extremities. Side lying may be particularly effective for some physically handicapped children. Relaxation exercises prior to and during this item will be helpful for spastic children.

MATERIALS: Sticky foods such as honey, jelly, and syrup.

ACTIVITY: Observe for hand to mouth movement and record. It may be occurring spontaneously. If not, put a sticky food (honey, jelly, syrup) on his hand and guide it to his mouth for him to experience it. Observe and record again.

To Adapt Activity:

1. Select material from Categorization of Materials list to which the child demonstrates a response, that may encourage hand to mouth movement. Select position to make the movement easier for the child, (e.g., side-lying, supported, etc.).
2. Provide multisensory exploration which includes giving physical prompts as necessary to help teach him what you want him to do. Be cautious if a vibrator is selected. This is aversive to some children.
3. Present the activity.
4. Observe response. Record.

Examples of Adapted Activity

Category/Material: Illuminated; visual/flashlight

Environment/Position: Darkened room, child seated upright at table, place bolster on table and child's hand on bolster (should be at head level)

Behavior: Christy will move head and mouth forward to touch hand.

Activity: Shine light on Christy's hand. When she visually attends to hand, prompt her in bringing her head forward until her mouth touches the hand.

Multisensory Exploration: Guide Christy in touching the flashlight. Turn it off and on to provide opportunities to attend to areas illuminated by light. Also, guide Christy's head to hand that has been elevated to head level.

Communication Cue (Anticipatory): Just before turning on light, touch Christy's lips with your hand. Say "find hand Christy."

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AREA: Functional Use of Objects and Symbolic Play (Schemes)

BEHAVIOR: Combines two objects in a functional manner.

MEASUREMENT: Spontaneously combines the two related objects in a functional manner, record number of combinations in a one minute time period, give 10 trials.

POSITION: Any position that maximizes ability to use upper limbs. The child may be placed in an infant seat, corner chair, etc, as is necessary, or may be held on the caretaker's lap.

MATERIALS: Examples of functionally related objects: doll with hair and comb or brush; xylophone and stick; drum and stick; spoon and bowl.

ACTIVITY: Present the child with a box of toys and observe his spontaneous behavior with them, record.

To Adapt Activity:

1. Select material from Categorization of Materials list to which the child demonstrates a response. Select a behavior that is within the child's physical capability and a position to facilitate that behavior. Present the toys out on a surface so that all are visible and/or available at the same time. Combinations may be made with appropriate body part such as spoon in mouth, brush to hair, etc.
2. Provide multisensory exploration.
3. Present activity.
4. Observe response. Record.

Example of Adapted Activity

Category/Material: Tactile, Auditory/Toothbrush with chime sound (commercially available)

Environment/Position: Same position, have room as free as possible from auditory distractions

Behavior: Rick will pick up toothbrush and bring it to his mouth

Activity: Take Rick to sink. Have toothbrush within easy reach. After presenting directions "Brush your teeth," prompt as needed in having Rick pick up toothbrush and bring to mouth.

Multisensory Exploration: Guide Rick in feeling perimeter of sink and then to toothbrush. Always have toothbrush in same location. Let him feel toothbrush and take it to his mouth before starting activity.

Communication Cue (Natural Gesture, Anticipatory): At beginning of activity put Rick's hand on yours. As you say "brush your teeth" lead his hand to his mouth and make a brushing motion.

AREA: Functional Use of Objects and Symbolic Play (Schemes)

BEHAVIOR: Spontaneously engages in adult activities with props.

MEASUREMENT: Spontaneously engages in an adult activity with a prop, without demonstration. Record number of activities during a one minute time period, give 10 trials.

POSITION: Any position which promotes freedom of movement.

MATERIALS: Dust cloth, small broom, dress-up clothes, play house, dolls, toy animals, toy telephone, etc.

ACTIVITY: Observe the child's spontaneous play and watch for his taking an adult role (putting dolls to bed, wiping up spills, talking on a play telephone, etc.).

To Adapt Activity:

1. Select material from Categorization Materials list to which the child demonstrates a response. Select a behavior that is within the child's physical capability and a position to facilitate that behavior. Place the objects out on a surface so that all are visible and/or available at the same time.
2. Provide multisensory exploration.
3. Present activity.
4. Observe response. Record.

Example of Adapted Activity

Category/Materials: Olfactory and tactile/lemon scented dish soap, sponge with plastic mesh cover, dirty dish with sticky Spaghettios on it.

Environment/Position: In kitchen area of school. Have table where the child can stand comfortably. Have dishpan on table filled with warm water.

Behavior: Alice will put detergent in water, then wash a dirty dish with a sponge until clean.

Activity: Give Alice symbol and command "wash dishes." Then take dirty dishes and wash them with a sponge.

Multisensory Exploration: Use props that have sensory qualities (see materials). Use the same qualities when providing the communication cue.

Communication Cue: Since this is an activity that should be routine, only provide communication cue outside of clean-up area. Hand Alice a mesh covered sponge that has a small amount of lemon scented dish soap on it. Give her the opportunity to smell the sponge. Tactilely sign "wash dishes."

References

Attermeier, S. M., Jens, K. G., & Johnson, N. M. (1979). Carolina Curriculum for Handicapped Infants: Field Test Edition.

Dunst, C. J. (1981). Infant Learning: A cognitive-linguistic intervention strategy. Hingham, MA: Teaching Resources.

Fraiberg, S. (1977). Insights from the blind: Comparative studies of blind and sighted infants. New York: Basic Books.

Langley, M. B. (1980) The teachable moment and the handicapped infant. ERIC Clearinghouse on Handicapped and Gifted Children: Reston, VA.

PART FOUR
SUPPLEMENTAL READINGS

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VISION: BASIC INFORMATION

Taken From: A Resource Manual for the Development and Evaluation of Special Programs for Exceptional Students: Volume V-E: Increasing Visual Efficiency (pp 4-22). by Orange County Public Schools Project IVEY

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Copies of the complete manual can be obtained from the Florida Department of Education.

BASIC ANATOMY OF THE EYE

Smith, Audrey J., and Cote, Karen Shane Look at Me. Philadelphia, PA: Pennsylvania College of Optometry Press, 1982, pp. 13-17.

Note: The following chapter was written by two orientation and mobility/low vision educational specialists with extensive experience teaching visually impaired children and adults.

Sight is the sense through which the brain receives approximately 75% of its information. Sight is made possible by the eye, serving as a channel through which visual information is perceived. The eye collects information about size, shape and color and transmits it to the brain where it is interpreted. The process by which the brain interprets information received from the eye is called vision. Vision is possible only if light is present. Light rays reflected off objects are received by the eye, converted into electrical impulses and interpreted by the brain. Vision, therefore, requires light and the partnership of the eye and the brain, the collector and the interpreter.

The emphasis in this manual is on vision: its functional evaluation and stimulation. To understand the visual process, it is first necessary to understand the eye, the organ through which visual information is collected and transmitted.

The EYE is a spherical organ, approximately one inch in diameter. It is suspended in a cone-shaped, bony structure called the ORBIT. The upper ridge of the orbit is the eyebrow and the lower ridge is the cheekbone. They both serve to protect the eye from direct impact. The front of the eye is also protected by the eyelids and lashes. The orbit is filled with fatty and fibrous tissue which cushions the eye and permits easy movement. The movement of the eye is controlled by six muscles connected to the outside of the eye. They are referred to as EXTRAOCULAR MUSCLES and various combinations of these muscles enable the eye to move up, down, diagonally and to the side.

The eye is composed of three major layers: the sclera, the choroid and the retina.

The SCLERA is the tough, fibrous outer layer which serves as the protective coat of the eye. The sclera, also known as the "white of the eye," gives durability and resistance to the wall of the eye. The CHOROID, or middle layer, is composed of a rich network of many tiny blood vessels. It is the eye's main circulatory layer and supplies nourishment to various parts of the eye, including the outer layers of the retina. The RETINA, or innermost layer of the eye, is a thin sheet of nerve tissue with ten distinct layers of cells. It serves to receive visual images and transmits information to the optical pathways of the brain through the OPTIC NERVE, which consists of a million separate nerve fibers. The optic nerve and retina are actually specialized portions of the brain.

Approximately 5/6 of the eye's surface is covered by the sclera. The clear covering over the sclera is a protective mucous membrane called the CONJUNCTIVA. Part of the conjunctiva which lines the inside of the eyelids provides nutrients to the front of the eye. It contains glands that secrete the mucus which lubricates the front of the eye. The clear, transparent front portion of the eye is the cornea (the other 1/6 of the eye's surface). The CORNEA is the protective "window" through which light rays enter the eye. It is composed of five layers of tissue, is highly refractive and bends light rays as they enter the eye. Between the cornea, iris and lens is a space filled with a liquid referred to as AQUEOUS HUMOR. The aqueous is a clear, watery fluid which fills the front chambers of the eye. Its purpose is to nourish the cornea and lens.

The IRIS is a colored, ring-like membrane suspended between the cornea and the lens. When we say that someone has blue or brown eyes, we are referring to the color of his or her irides. The amount of pigment determines the color of the eye (blue eyes have less pigment, brown eyes more). In the center of the iris is an opening called the PUPIL, through which light travels and is transmitted to the back of

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the eye. The iris, composed of connective tissue cells, contains a bundle of muscle fibers which control the size of the pupil, enabling it to constrict or dilate. In bright light the pupil will constrict, affording protection from too much light or glare. In dim light the pupil will dilate, allowing as much light as possible to enter the eye.

The LENS is a colorless and almost completely transparent, flexible body which is suspended directly behind the iris by ZONULAR FIBERS or SUSPENSORY LIGAMENTS. It is convex on both surfaces and serves to bend light rays which have entered the eye through the cornea and passed through the pupil. The CILIARY MUSCLE controls the shape and focusing power of the lens. The ciliary muscle is a portion of the ciliary body which is located between the choroid and the iris. The CILIARY BODY is both a vascular and muscular structure with the dual function of producing aqueous fluid and, through its muscles, controlling the shape of the lens. Thus, it is instrumental in both nourishing the cornea and lens and controlling the eye's focusing ability.

The posterior 4/5 of the eye is filled with vitreous fluid, referred to as VITREOUS HUMOR. The vitreous is a transparent, gel-like substance which adheres to the back surface of the lens and to the back and sides of the eye. The vitreous enables the eye to maintain its shape and resilience. After light rays have been bent by the lens, they pass through the clear vitreous to the retina.

The RETINA receives light rays reflected off objects. It then converts the light impulses into electrical impulses, and transmits these impulses through the optic nerve to the brain. The photoreceptive layer of the retina is composed of several million light-sensitive receptors called rods and cones. The CONES provide the ability to detect fine detail and color. They function best in daylight or under conditions of higher illumination. The majority of cones are concentrated in the MACULA or central retina. Damage to the macular area, therefore, results in reduced ability to perceive detail and color. The RODS provide the ability to detect gross form and movement; they function best in conditions of minimum light. Under conditions of minimum light our clearest

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vision is attained by looking slightly to either side, instead of directly at objects, since the majority of rods are located approximately 20° from the macular area. Damage to the peripheral retina results in reduced abilility to function in conditions of dim illumination.

The rods and cones are also referred to as the "where" and "what" systems of the eye. Movement in the periphery (where) is best perceived by our side vision or rods. A reflex is then initiated to direct our central vision or cones for best identification (what) of the source of movement.

As previously mentioned, the retina receives light rays which are converted into electrical impulses. The OPTIC NERVE serves as the passageway through which these impulses travel from the retina to the brain. If all parts of the eye are functioning correctly, the information made available to the brain enables the individual to create a complete image. The EYE, which collects information, and the BRAIN, which interprets information, must work together for an individual to realize an optimum level of visual functioning.

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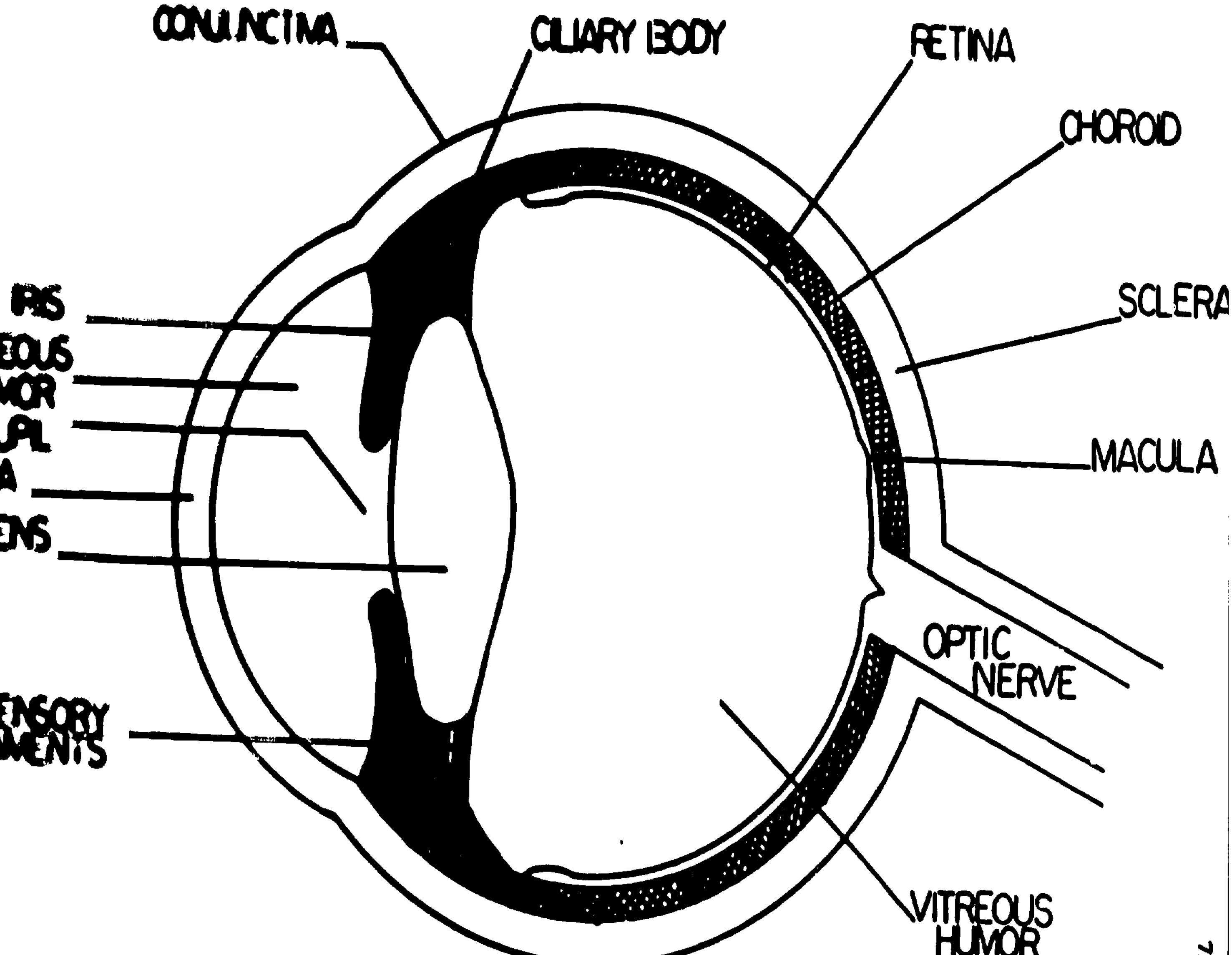
SCHEMATIC OF THE EYE



BASIC OPTICAL PRINCIPLES OF THE EYE

Smith, Audrey J., and Cote, Karen Shane Look at Me. Philadelphia, PA: Pennsylvania College of Optometry Press, 1982, pp. 19-32.

Note: The following chapter was written by two orientation and mobility/low vision educational specialists with extensive experience teaching visually impaired children and adults.

In this chapter the eye is discussed as an optical system, or mechanism for bending or refracting light rays. In order to understand how the eye functions as an optical system, it is important to have a basic understanding of a few key terms:

Refraction — The bending of light rays as they pass from one medium to another.

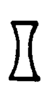
Diopter — The unit used to measure refractive or bending power of lenses and prisms.

Accommodation — The process by which the lens of the eye changes shape or refractive ability to adjust for viewing objects at various distances.

Convex Lens
plus (+) lens

— A lens with an outwardly curved surface. Light rays passing through a convex lens converge, or come together.

Concave Lens
minus (-) lens



— A lens with an inwardly curved surface. Light rays passing through a concave lens diverge, or spread apart.

Myopia
(nearsightedness) — A condition in which the visual image is focused in front of the retina, resulting in defective distance vision.

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Hyperopia (farsightedness) — A condition in which the visual image is focused behind the retina, which may result in defective near vision.

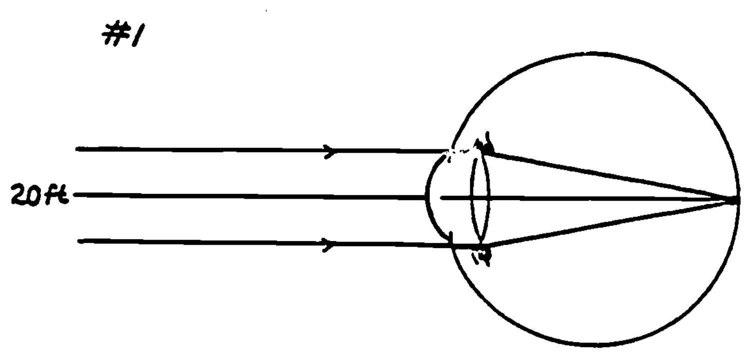
Astigmatism (no point of focus) — A condition caused by irregular curvature of the cornea and/or lens, which prevents light rays from coming to a single point of focus on the retina. Instead, the light rays form image lines at different locations, resulting in a blurred or distorted image.

Refraction

The eye serves as a mechanism for refracting or bending light rays. The parts of the eye capable of bending light rays are the cornea, lens, aqueous and vitreous humor. The cornea is the first surface light contacts as it travels through air and meets the eye. It is responsible for approximately 80% of the eye's refractive power. The aqueous and vitreous provide a minimum amount of the eye's refractive power. The refractive power of the lens varies since its shape is automatically changed to accommodate for viewing at different distances.

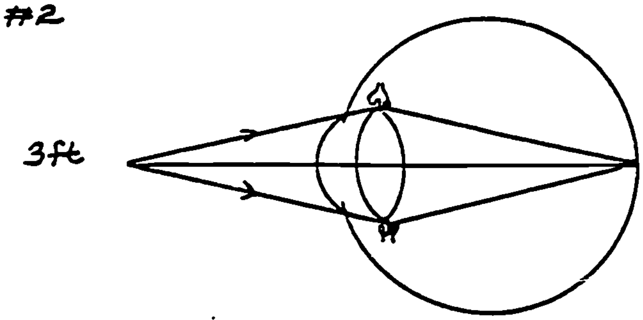
Accommodation

Accommodation, the process of change in the lens' shape and refractive power, is controlled by the ciliary muscle. When the ciliary muscle contracts, it loosens the zonules and causes the lens to become more convex or have more bending power for close work. The amount of accommodation, or extent of change in the refractive power of the lens, depends on the distance of the object from the eye.



In diagram 1, the ciliary muscle is relaxed, and the accommodative system is at rest. When the eye views an object at a distance of twenty feet or greater, light rays emitted from that object enter the eye parallel and come to a point of focus on the retina. An emmetropic, or normal eye, needs no additional refractive power to bring together or converge parallel light rays to a point of focus on the retina.

#2



In diagram 2, the ciliary muscle is contracted, and the accommodative system is exerted. When the eye views an object at a distance of less than twenty feet, light rays emitted from that object enter the eye diverging or spread apart. The closer the object is to the eye, the more the light rays are diverged. The more divergent the light rays, the greater the accommodation necessary to bring them to a point of focus on the retina.

When the accommodative system is exerted, the lens becomes more convex, affording the eye greater refractive or bending power. With this additional refractive power, the light rays are brought together or converged to a point of focus on the retina.

#3

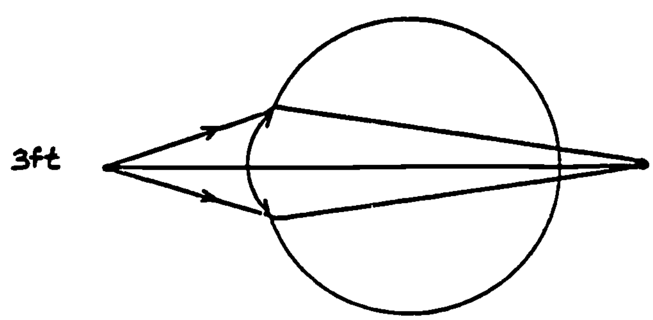


Diagram 3, illustrates an aphakic eye, or eye without a lens. The eye is viewing an object at a distance of less than twenty feet. Therefore, light rays emitted from the object enter the eye diverging or spread apart and come to a point of focus behind the retina. A blurry image results because the eye lacks a lens, thus lacking the accommodative ability to converge the light rays to a point of focus on the retina.

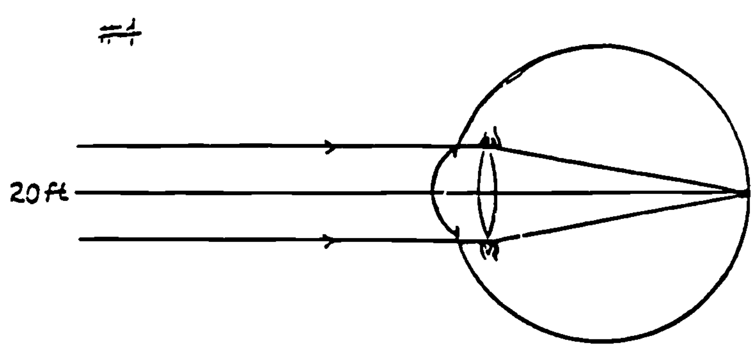
The lens in a child's eye has more elasticity than the lens in an adult's eye. The child, therefore, has greater accommodative ability, which explains why most children can work at closer distances for longer periods of time. It must be remembered, however, that prolonged work at close distances forces prolonged accommodation and places the child under stress which, in turn, can produce inattentiveness, irritability and fatigue.

Refractive Errors

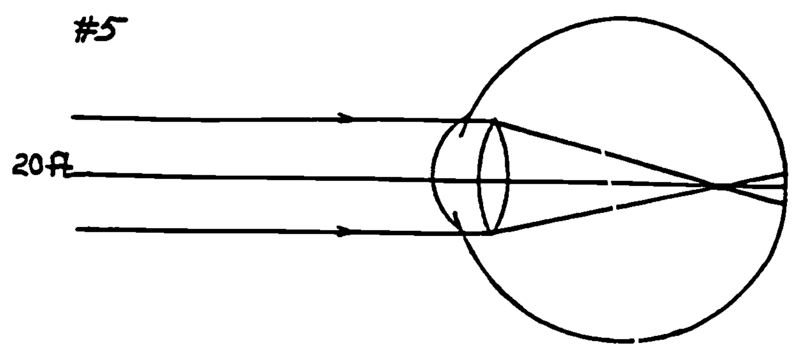
Myopia, hyperopia and astigmatism are the three possible refractive errors of the eye. Myopia and hyperopia are caused by one of the following:

1. Length of the eye
2. Amount of refractive power of the eye
3. Combination of both

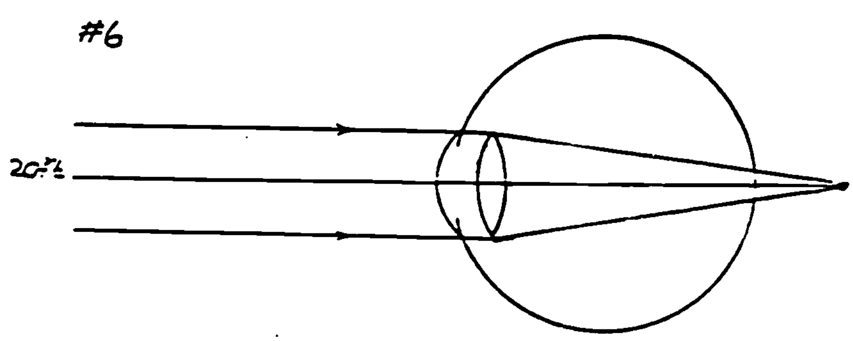
Length



In diagram 4, the length of the eye is appropriate for its focusing ability. Light rays come to a point of focus on the retina, and a clear image is made possible.



In diagram 5, the eye is too long for its focusing ability, causing myopia or nearsightedness. Because the eye is too long, light rays come to a point of focus in front of the retina, and a blurry image results.



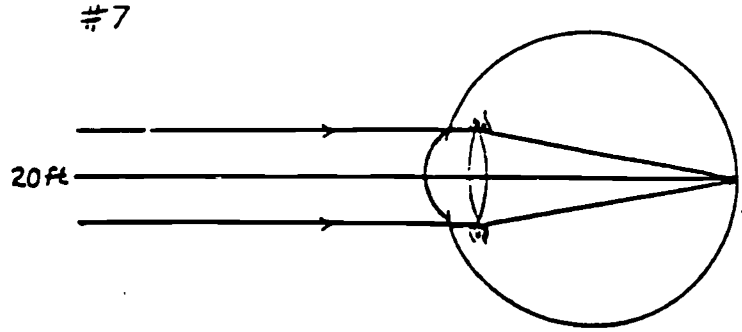
In diagram 6, the eye is too short for its focusing ability, causing hyperopia or farsightedness. Because the eye is too short, light rays come to a point of focus behind the retina, and a blurry image results.

Refractive Power

Probably the most common cause of refractive errors is the amount of refractive power in the eye. Normally, the eye's refractive power is approximately plus (+) 60 diopters. The cornea, lens, aqueous and vitreous are the parts of the eye comprising this +60 diopters of bending power. The cornea accounts for approximately +42 diopters, the

lens, at rest, for approximately +15 diopters and the aqueous and vitreous for the remaining bending power.*

#7

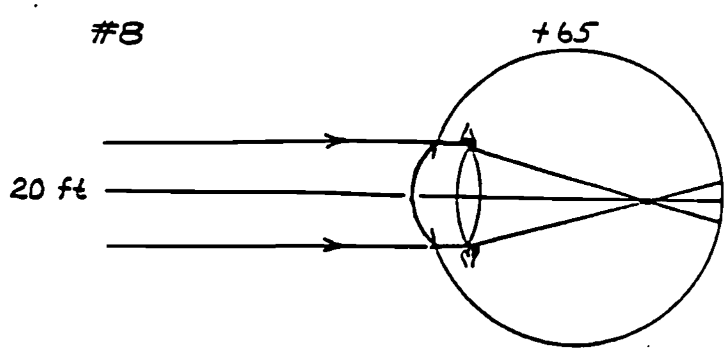


In diagram 7, the length of the eye is appropriate and the amount of the eye's refractive power is +60 diopters. This is the approximate amount of refractive power necessary to bring light rays to a point of focus on the retina, where a clear image is made possible.

Myopia

If the total refractive power of the eye is greater than +60 diopters, the eye has too much converging or plus bending power. As a result, when light rays pass through the eye, they are converged too soon and are brought to a point of focus in front of the retina.

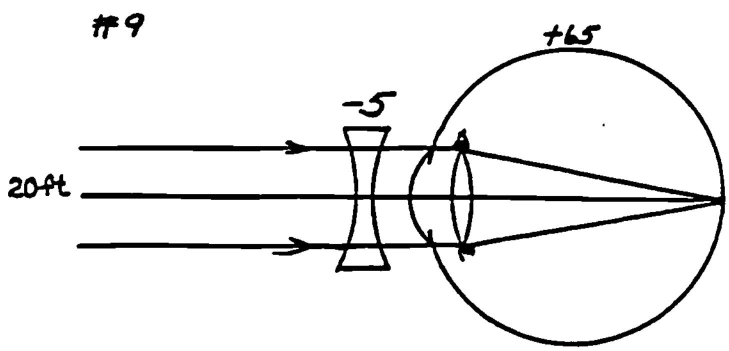
#8



In diagram 8, the eye has a total of +65 diopters, resulting in too much plus bending power. Too much plus bending power causes too much convergence of light rays. The light rays, therefore, are brought to a

*Borish, Irvin M., Clinical Refraction. The Professional Press, Inc.: Chicago, IL, 1970. Vol. I

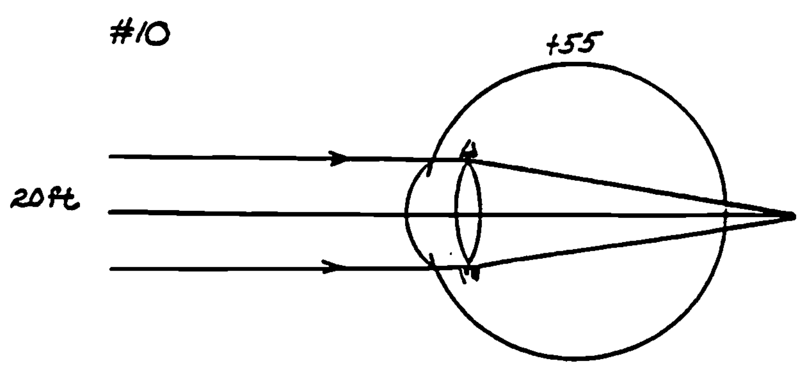
point of focus too soon or in front of the retina. This individual is myopic or nearsighted and can be corrected with the proper minus (concave) lens. The concave lens diverges (spreads apart) light rays, thus reducing the eye's total refractive power and bringing the light rays to a point of focus on the retina.



In diagram 9, an eye care specialist may have prescribed a -5 diopter lens, thus reducing the converging (+) power by 5 diopters and bringing the refractive power of the eye back to the normal +60 diopters necessary to bring light rays to a point of focus on the retina.

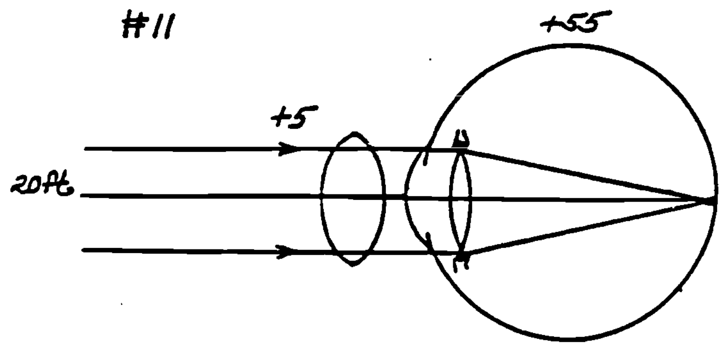
Hyperopia

If the total refractive power of the eye is lower than +60 diopters, the eye has insufficient convergence or plus bending power. As a result, when light rays pass through the eye, they are not converged sufficiently and come to a point of focus behind the retina.



In diagram 10, the eye has a total of +55 diopters, resulting in insufficient plus bending power. Insufficient plus bending power causes insufficient convergence of light rays. The light rays, therefore, are

not brought to a point of focus until they are <u>behind</u> the retina. This individual is hyperopic or farsighted and can be corrected with the proper plus (convex) lens. The convex lens converges (brings together) light rays, thus increasing the eye's total refractive power and bringing light rays to a point of focus <u>on</u> the retina.



In diagram 11, an eye care specialist may have prescribed a +5 diopter lens, thus increasing the converging (plus) power by 5 diopters and bringing the refractive power up to the normal +60 diopters necessary to bring light rays to a point of focus <u>on</u> the retina.

Astigmatism

Astigmatism is a condition where light rays are not refracted uniformly in all meridians. It is due to an irregular corneal or lens curvature, and results in a blurred or distorted image. An irregular curvature of the cornea most often causes astigmatism. Since the refractive power of the cornea is related to its curvature, any difference in its meridians, or lack of symmetry in its curvature, will result in astigmatism and the formation of image lines at different locations instead of one point of focus.

In an astigmatic eye there is a meridian of greatest power (steepest curvature) and one of least power (flattest curvature). The difference in power between these two meridians is the amount of astigmatism. Generally, these meridians are 90 degrees apart. They can be the true horizontal or vertical meridians of the eye (i.e., 90° and 180°) or can be at any angle with respect to the true horizontal and vertical (i.e., 20° and 110°, 80° and 170°). Only one meridian is designated as the

axis of astigmatism, and either the greatest or least power meridian may be so designated.

Astigmatism can be functionally explained by using an example of a person looking at a cross. If light rays reflected off the vertical area of the cross are being focused on the retina while light rays from the horizontal area are not, then the vertical arm of the cross will appear clear while the horizontal arm may appear blurry. In this case, a lens with no power in the vertical meridian and the proper correcting power in the horizontal meridian is prescribed by an eye care specialist to bring both arms of the cross into clear focus.

A type of lens which has varying refractive powers in different meridians is called a cylindrical lens. A cylindrical lens is prescribed to correct astigmatism, the condition of varying refractive powers in the meridians of the eye. The amount of cylinder is measured in plus or minus diopters. The greater the degree of astigmatism, the more blurry the image, and the more diopters of cylinder will be necessary to correct this condition.

Prescription Lenses: Rx

Having a knowledge of the basic optics of the eye and of methods for correcting the eye's optical problems enables one to more clearly interpret a child's Rx or prescription lenses. This information is available on most eye reports and should be understood before working with the child.

The following are examples of notations on eye reports which indicate myopic and hyperopic conditions:

1. Rx: OD +1.75 OS +1.00
2. Rx: OD -8.00 OS -7.25
3. Rx: OU +14.00

In example #1, the child has a spectacle correction of plus one and three quarter diopters for the right eye and plus one diopter for the left eye. This probably means the child is mildly hyperopic and needs plus (convex) lenses to correct the condition.

In example #2, the child has a spectacle correction of minus eight diopters for the right eye and minus seven and one quarter diopters for the left eye. This probably means the child is highly myopic and needs strong minus or thick concave lenses to correct the condition. This child would have much difficulty seeing objects clearly at a distance without corrective lenses.

In example #3, the child has a prescriptive correction of plus fourteen fo both eyes. This could have two implications. The child's eyes could be highly hyperopic, or the child may be aphakic due to cataracts and subsequent bilateral lens removal. In the latter case, spectacle lenses may have been prescribed to replace the refractive power lost when the lenses in the child's eyes were removed.

The following are examples of notations on eye reports which include corrections for astigmatism:

1. Rx: OD +2.00 -1.00 X 90
2. Rx: OD Plano -6.00 X 180

In example #1, the child's right eye is slightly hyperopic and has one diopter of astigmatism. This correction indicates fairly mild conditions of hyperopia and astigmatism.

In example #2, the child's right eye is neither myopic nor hyperopic, but has six diopters of astigmatism. This child would probably have difficulty seeing clearly, especially at a distance, without corrective lenses.

If a child is wearing the proper corrective lenses, light rays will be brought to focus on the retina. Even with corrective lenses, however, it is possible that the image may not be clear if any additional anomaly or pathology exists.

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FUNCTIONAL IMPLICATIONS OF COMMON PATHOLOGIES OF THE EYE

Geruschat, Duane R. "Functional Implications of Common Pathologies of the Eye." In The Interdisciplinary Approach to Low Vision, pp. 54-81. Edited by Monica Beliveau and Audrey J. Smith. Prepared for the National Training Workshop in Low Vision, Chicago, IL, August, 1980.

Note: The following chapter was written by an orientation and mobility specialist with seven years experience teaching visually impaired children and adults in various settings.

When thinking of problems associated with visual impairment, one's first thoughts often focus on reduced visual acuity, possibly constricted visual fields. When considering treatment options, we usually concentrate on optical aids. Make the image larger, the person will see better, the problem is solved.

Reduction of visual acuity or constriction of visual fields can have a profound effect on an individual's visual functioning. The reduction can be so great as to require major changes in the person's lifestyle, travel methods, work habits and overall functioning. Optical aids can be of great benefit to solving these life skill problems. However, just an optical aid, with or without adequate training, is not the only answer. There are many functional problems, caused by the reduction of visual acuity or constricted visual fields, which cannot be totally solved with optical aids. For example, photophobia, nystagmus, poor night vision and lack of depth perception are only a few of the common problems which cannot be entirely managed with optical aids.

This paper is divided into three components. The first is a brief review of definitions of common pathologies. The second component is a chart which indexes the pathologies and commonly associated functional problems. The third component examines the common functional problems associated with the pathologies. These problems are then followed by suggestions for remediation which may be used to assist the person in adapting to the effects of the eye condition.

Optical aids (i.e., microscopes, telescopes, etc.) are not mentioned unless they perform a unique role in the functional management of the individual's problem (i.e., fresnel prisms, reverse telescopes). A comprehensive low vision examination, with prescription of commonly used optical aids is assumed.

DEFINITIONS OF COMMON EYE PATHOLOGIES

Albinism Albinism is a congenital condition characterized by lack of pigment in the skin and hair, and lightly colored irides. It generally results in photophobia and high astigmatic errors. Albinism can be a complete or a partial lack of pigment affecting various structures. In cases where only the eyes are affected, the pathology is referred to as ocular albinism.

Aniridia Aniridia is a failure of the iris to fully develop. It results in difficulty adapting to various lighting conditions because of the inability to control the amount of light entering the eye. With this condition, the pupil of the eye may appear unusually large.

Aphakia Aphakia is the absence of the lens in the eye, resulting in the inability to accommodate.

Cataract A cataract is any opacification of the lens. Depending upon location, extent, and density of the opacification, various ranges of reduced visual acuity and field losses can be expected.

Nystagmus Nystagmus is involuntary eye movement of unknown etiology, resulting in decreased visual acuity. It is generally associated with underdevelopment of another part of the eye.

Diabetic Retinopathy When diabetes affects the eye, diabetic retinopathy occurs and causes the hemorrhaging of blood vessels in the retina. This results in decreased acuity and fluctuating vision.

Glaucoma Glaucoma is increased intraocular pressure caused by an imbalance in the production and/or flow of aqueous fluid. It results in

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a gradual decrease in the peripheral and, if uncontrolled, central retinal areas.

__Hemianopsia__ Hemianopsia is the loss of approximately half the field of vision in one or both eyes. It is most commonly associated with strokes or head trauma.

__Macular Degeneration__ Macular degeneration is any destruction or degeneration of the macular area. Macular degeneration is characterized by loss of central visual field and reduction of visual acuity.

__Optic Atrophy__ Optic atrophy is a condition which affects the optic nerve fibers, causing varying r[illegible] such as reduced visual acuity, defective color vision, difficulty with night vision, etc. Results will depend on the extent and location of the atrophy.

__Pathological Myopia__ Pathological myopia is extreme nearsightedness due to lengthening of the eye and resultant stretching of the retina. It is commonly associated with a high incidence of retinal detachments.

__Retinitis Pigmentosa__ Retinitis pigmentosa is a degenerative, pigmentary retinal condition resulting in a gradual decrease of visual functioning. Degeneration usually begins in the peripheral retinal area, causing reduction in peripheral and night vision, and may progress to eventual total blindness.

OCULAR PATHOLOGIES AND COMMON FUNCTIONAL PROBLEMS

PATHOLOGY	SECONDARY CONDITIONS	PROGNOSIS	COMMON FUNCTIONAL PROBLEMS
Albinism	Nystagmus	Non-progressive	Glare/photophobia Nystagmus Congenitally poor visual acuity
Aniridia	Glaucoma, Cataracts, Nystagmus, Displaced lens, Corneal opacification	Dependent on extent of under-development	Poor light adaptation Glare/photophobia

PATHOLOGY	SECONDARY CONDITIONS	PROGNOSIS	COMMON FUNCTIONAL PROBLEMS
Aphakia	Glaucoma	Non-progressive	Peripheral field distortions Loss of accommodation Poor depth perception
Cataracts	Glaucoma	Progressive to total opacification	Scotomas Glare/photophobia Constricted pupil
Nystagmus	Usually is an accompanying condition	Non-progressive	Possible fixation difficulty Reduced acuity
Diabetic Retinopathy	Glaucoma, Retinal detachments, Cataracts	Progressive	Gradual loss of vision Fluctuating vision
Glaucoma		Progressive and non-progressive	Constricted visual fields Night blindness Light adaptation Glare/photophobia Effects of medication
Hemianopsia		Non-progressive	Loss of half of visual field Reading
Macular Degeneration	Cataracts	Progressive and non-progressive forms	Loss of central vision Scotomas
Optic Atrophy		Stable	Scotomas
Pathological Myopia	Retinal detachments, Cataracts, Macular hemorrhaging	Progressive	Peripheral field distortions
Retinitis Pigmentosa	Cataracts, Glaucoma	Progressive	Constricted visual fields Glare/photophobia Night blindness

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HEARING: BASIC INFORMATION

Taken From: Auditory Assessment and Programming for Severely Handicapped and Deaf-Blind Students (pp 3-7). by The Bay Area Severely Handicapped Project.

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Copies of the complete manual can be purchased from TASH.

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The Nature of Sound

Sound is a wave phenomenon. Sound waves are produced when air particles are set into vibration. Two dimensions of sound which are particularly important in understanding hearing and hearing loss are frequency and intensity.

Frequency is basically the number of vibrations of air particles per second. Frequency is measured in terms of Hertz (Hz) or cycles per second (cps). The normal human ear has a frequency range of approximately 20-20,000 Hz. Sounds falling below or above this range cannot be heard by humans. Speech sounds, which are major concern for clinical audiology, occur mainly within the range of 300-4000 Hz. Hearing is typically tested from 250-8000 Hz.

The psychological attribute which corresponds to frequency is pitch. Low frequency sounds are perceived as low pitched sounds, while high frequency sounds are high pitched sounds. Middle C on a piano is a 250 Hz sound; one octave below middle C is 125 Hz. Other predominantly low pitched sounds include the bass drum, the hum of an air conditioner, and low male voices. Predominantly high pitched sounds include the doorbell, a violin, or a soprano voice. Speech sounds consist of vowels and consonants. Generally speaking, vowels are low frequency sounds and consonants are high frequency sounds. The implications of the differing frequencies of speech sounds are considerable, and are discussed in some detail below under Speech Acoustics.

Intensity corresponds to the psychological attribute of loudness. A measure of intensity is actually a measure of the pressure of the sound wave (sound pressure level, or SPL). The unit used in measuring intensity is the decibel (dB).

The range of useable hearing is from 0 dB to 120 dB SPL (threshold of discomfort). Another way of discussing hearing is in dB HL (Hearing Level). Hearing level refers to measurements made on an audiometer. 0 dB HL does not indicate the absence of sound, but rather it is the intensity required for a normal hearing person to detect sound. For example, 0 dB HL (Speech) is equal to 13 dB SPL (20 dB SPL under earphones). 0 dB HL of a tone may equal 10-25 dB SPL of the tone. To convert dB SPL (the physical presence of sound waves) to dB HL (the reading on an audiogram), one must subtract 7-25 dB (depending on the sound).

To appreciate the wide range of sounds the human ear can hear, it is important to remember that decibels are intensity *ratios*, and thus do not merely increase arithmetically. Twenty decibels (10 *plus* 10 decibels) does not correspond to a doubling of intensity, but rather to a 100-fold (10 *times* 10) intensity change. The range of intensities covered by a dB scale of 0 to 130 decibels is therefore considerable: The strongest sounds an average person can hear without pain can be as much as 10 million times greater in intensity than a sound which is barely audible (Denes and Pinson, 1963). Approximate decibel levels for various sounds are presented below:

20 dB SPL.......whisper at four feet
50 dB SPL....quiet auto ten feet away
60-70 dB SPL.... normal conversation at three feet
90 dB SPL..pneumatic drill at ten feet
110 dB SPL..........Hi fi at ten feet

These levels are approximate, but should provide a sense of the wide range of intensities the dB scale measures.

In addition to frequency and intensity, every sound also has *spectral* characteristics. Rarely is a sound simply the product of one frequency produced at one intensity level, as is the case with pure tones typically used in formal audiological testing. Rather, most sounds are complex sounds, consisting of several frequencies and differing intensities. The resulting interaction of these frequencies and intensities produces the spectral characteristics, or quality, of the sound.

Speech Acoustics refers to the study of the nature of speech sounds. Speech sounds belong to one of two main categories: vowels, which are produced with an unrestricted vocal tract, and consonants, which are produced through various constrictions of the air passing through the vocal tract. In terms of frequency and intensity, vowels are lower frequency sounds, generally having their most intense frequency components below 750 Hz. Consonants are composed of higher frequency sounds often consisting of a wide range of frequency components. In addition, vowels and consonants also differ in the amount of acoustical energy they produce. For an equivalent amount of vocal effort, the range between the loudest vowel ɔ, as in dog, and the softest consonant th, as in this, is 28 dB. Vowels are therefore the most intense sounds heard in speech, while consonants are considerably less intense.

Despite being softer, consonants carry the most information for speech comprehension. Consider, for example, reading aloud a telegram in which all vowels have been left out. Comprehension of the message would probably still be quite good. For example, "chkbk stln. Snd mny c/o htl.", is reasonably comprehensible. If, however, only the vowel sounds were left in and the consonants omitted, comprehension would be negligible. If the message were "eoo oe. e oe c/o oe.", its intelligibility would be dubious. Thus, while vowel sounds are the most readily heard, it is the softer consonant sounds which are most critical for speech intelligibility. Data exist showing that consonants above 1000 Hz provide 60% of speech intelligibility, while vowels below 500 Hz (which are the loudest speech sounds) provide only 5% of speech intelligibility (French and Steinberg, 1947).

Shouting at an individual with a known or suspected sensorineural hearing loss will do little to improve comprehension, because the vowels will become even louder while the consonants will continue to be less audible (because it is difficult to "shout" a consonant sound). Also for this reason, even mild or moderate hearing losses (in the 30-60 dB range for children) can have a significant effect upon speech intelligibility. For example, consider speech that is delivered at 70 dB SPL. The vowel sounds will be about 70 dB, however, the consonants will only be about 50 dB. Therefore, an individual with a 60 dB loss may miss hearing many of the consonants and speech understanding will be poor. In addition, verbal exchanges rarely occur in totally silent environments. Usually communication takes place against a background of low level environmental sounds. This background noise is typically low frequency. Low frequencies tend to have a masking effect on higher frequencies. Therefore, high frequency consonants in the speech message can be somewhat obscured by the additional low frequency noise present in the environment.

It should be noted, however, that for individuals with conductive type hearing losses (see page 7), it may be helpful to speak in a slightly louder than normal voice, because conductive losses typically affect low frequency vowel sounds. Therefore, increasing speech loudness may enhance speech comprehension for these individuals.

The complex nature of the relationship between the audibility and the frequencies of speech stimuli underscores the need for careful and thorough audiological evaluations. To provide effective amplification for speech, the most crucial of all auditory stimuli, the audiologist must determine the type of loss (discussed further below), the degree of the hearing loss, and the frequen-

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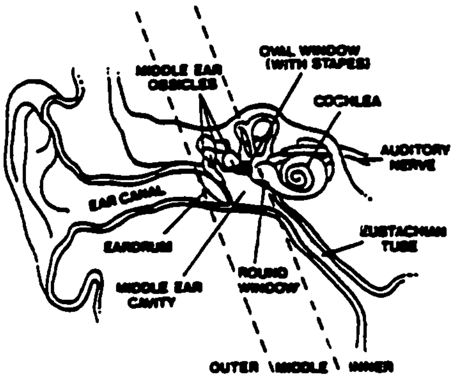
cies at which the loss is present.

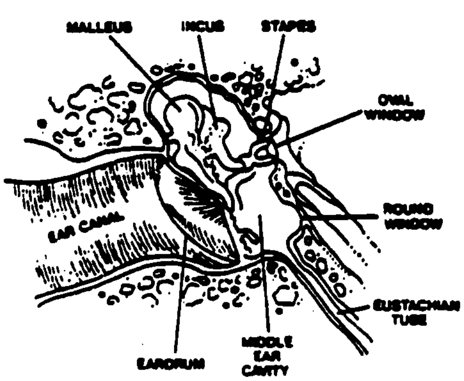
Structure of the Ear

The ear is typically considered in terms of three segments: outer, middle, and inner ear. These are presented in Figure 1 below.



The outer ear consists of two major parts: the fleshy, externally visible part of the ear (the pinna), and the ear canal, which is an air filled passageway that ends at the ear drum. The outer ear serves four main functions: it acts as a resonator for tones around 3000-4000 Hz., it protects the eardrum, it makes possible consistent temperature and humidity in the middle ear and it collects high frequencies. Were the eardrum located directly on the surface of the head, these functions would not be possible.

The *middle ear* connects the ear drum to the inner ear by means of the auditory ossicles (three small bones): the malleus (hammer), the incus (anvil) and the stapes (stirrup). When the ear drum is set in motion by sound waves which travel through the ear canal, this motion is picked up by the malleus and transmitted to the incus. The incus further transmits the motion to the stapes. The stapes in turn moves in and out of the oval window, which is the entrance to the inner ear. Figure 2 below presents a cross sectional illustration of the middle ear.

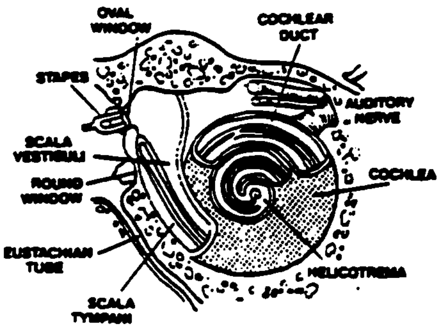


The middle ear serves two main functions. The first is to increase, or amplify, the pressure of the sound waves at the oval window, so that the inner ear receives an increased amount of acoustical energy. The way in which the middle ear does this is by acting as a kind of "funnel" between the eardrum and the oval window. The surface area of the eardrum is about 25 times larger than the surface area of the oval window, so that the pressure received at the eardrum and transmitted through the ossicles is now applied by the stapes to a much smaller area. The result is that the pressure applied to the oval window is about 25dB greater than it would be without the middle ear, i.e., if sound traveled directly from the canal to the oval window. This amplification makes it possible to hear sounds which would otherwise not be heard.

The second function of the middle ear is to guard against damage to the inner ear from extremely loud sounds. Two small muscles work to achieve this protective function. In response to loud sounds, one muscle pulls in the eardrum, while the second pulls the stapes back from the oval window. As a consequence, the middle ear becomes a less effective sound transmitter. Additionally, muscle contractions can change the normal axis of rotation of the stapes, which will also decrease the pressure variations reaching the inner ear through the oval window. This response is reflexive, but is not instantaneous. Therefore, in the time it takes this protective mechanism to go into effect, abrupt, intense sounds can still cause permanent damage to the inner ear. Drugs can also affect the functioning of these reflexes, so that for example, an individual taking certain medications for seizures (phenobarbytol, dilantin) may not automatically have these responses. Conductive hearing losses can also obliterate the reflex action (although the conductive component itself acts as a sort of protective mechanism). Furthermore, certain degrees of sensorineural loss will render the reflex impossible to measure. The presence or absence of these reflexes can be determined using impedance audiometry and is typically one measure in a battery of assessments made by a clinical audiologist (see Section III below).

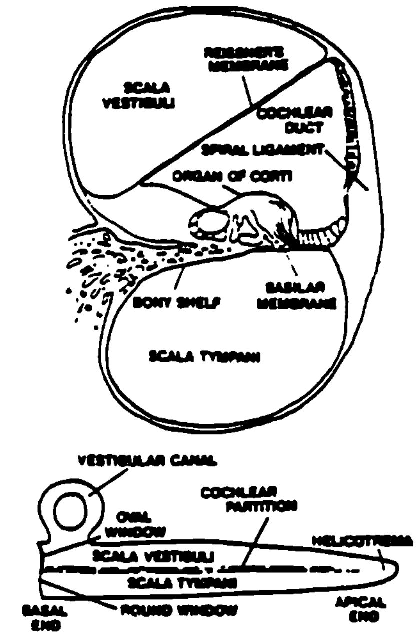
The last aspect of middle ear function concerns the eustachian tubes, which run between the middle ears and the nasopharynx. The function of the eustachian tubes is to provide a link between the middle ear and outside air so that the pressure inside and outside the middle ear cavity can be equalized. This is normally accomplished by swallowing, which allows the Eustachian tube to open momentarily. If this were not the case, unequal pressures inside and outside the middle ear cavity might bend, deform, or possibly rupture the eardrum.

A diagram of the inner ear is presented in Figure 3.



The major structure in the inner ear is the cochlea, which is coiled like a snail shell. There are some 30,000 nerve cells in the cochlea. It is within the cochlea that mechanical vibrations received at the oval window are transformed into nerve impulses which travel along the auditory nerve to the brain.

A full discussion of the construction and functioning of the cochlea is too lengthy for purposes of this manual, and the reader is referred to Denes and Pinson (1963) for detailed explanations. However, Figure 4 presents a cross section and a view of the cochlea as it would appear if it were unrolled.



Coursing through the center of the cochlea is the basilar membrane. The basilar membrane movement accounts for the cochlea's reaction to activity at the oval window.

Inside the Organ of Corti are hair (nerve)

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cells. One end of each cell rests on the basilar membrane. When the membrane vibrates, the hair cells are bent.

Nerve fibers from the auditory nerve extend into the Organ of Corti and come to rest very near the hair cells. These nerve fibers then carry pulses to the brain. For most frequencies, pitch is determined by *where* on the basilar membrane the stimulation occurs. If high frequencies are received, the vibration is strongest in the part of the basilar membrane nearest the oval window, where the membrane is stiffest. If lower frequencies are received, the vibration is strongest in the wider and more flexible end of the membrane. *Intensity* is determined by how many hair cells are stimulated. The more intense sound, the more hair cells are stimulated, and the faster they fire. Thus, stimulation from the middle ear is converted into patterns of vibration on the basilar membrane which are then translated by the Organ of Corti into signals that can be electrically transmitted along the auditory nerve.

Common Causes of Hearing Loss and Deafness

Hearing losses are typically categorized as either conductive, sensorineural, mixed or central auditory disorders.

Conductive impairments are losses resulting from interference in the pathway from the ear canal to the inner ear. The inner ear functioning is intact, but the air conduction pathway is in some way defective. The result is a loss of air conducted sounds, although the individual can typically hear sounds conducted directly to the inner ear through an audiological procedure known as bone conduction testing. A majority of losses which are conductive can be corrected through medical treatment or surgery (Northern and Downs, 1978).

Sensorineural impairments are losses involving damage to the inner ear and/or the auditory nerve. In this case, physical examination of the outer ear may reveal an external canal and ear drum which look normal, since the loss is due to deficits beyond the ear drum. Sensorineural losses are usually irreversible.

Mixed impairments are those in which both the conductive and sensorineural systems are deficient. The mixed loss will improve only as much as the conductive loss is ameliorated and will typically not return to normal hearing ranges (Northern and Downs, 1978).

Central Auditory Disorders. The auditory system is considered in terms of the peripheral mechanism which extends from the outer ear to the ending of the acoustic nerve in the brain stem, and the central auditory system, which involves the neurons leading from the brain stem into specific areas of the brain (Goldstein et. al. 1972). Lesions in the peripheral system result in decreased auditory acuity in the form of conductive, mixed, or sensorineural losses. Lesions in the central auditory system affect the coding and analysis of auditory information, and are independent of deficits in the peripheral system. Thus, an individual may have normal auditory sensitivity, but may be unable to respond meaningfully to sound due to central organic dysfunctions. Differential diagnosis of central disorders and peripheral impairments can be a complex problem, particularly with severely handicapped students. Amelioration of central disorders is not accomplished through hearing aids but through language therapy and educational interventions.

Some possible causes of sensorineural and conductive losses are briefly described in Tables 1 and 2, but this list is by no means exhaustive.

In addition to conditions described in Tables 1 and 2, a teacher of severely handicapped students should be aware of the need for prompt referral to a medical specialist if any of the following conditions are observed:

Foreign objects in the ear canal, including toys, food, pebbles, crayons, etc.

Aural discharge. Discharge from the ears may be clear, cloudy, or bloody, each indicating different possible causes and all requiring prompt medical attention.

Extreme sensitivity of the pinna. If touching a student's ear causes wincing, cringing, or other overt signs of discomfort, otitis externa, an inflamation of the skin in the external canal, may be pressent. This condition often occurs in hearing aid users, where ear molds may block adequate ventilation of the skin in the canal. If a student is unable to insert and remove his own aids, the teacher should be alert to any redness and apparent tenderness in the canal when putting aids on or off. If sensitivity is observed, an otologist should be consulted.

Table I: POSSIBLE CAUSES OF SENSORINEURAL LOSS

ANTENATAL and NEONATAL	
Maternal Infections (e.g.), Rubella (German Measles) Congenital syphilis Asian flu Cytomegalic Inclusion Disease	A number of maternal bacterial and viral diseases may result in varying degrees of sensorineural loss. Effects may vary, mainly depending upon when during pregnancy the infection is contracted. Some viruses, such as the cytomegalovirus may be asymptomatic in the mother but can be passed on to the infant with severe effects upon the central nervous system. These viruses may result solely in hearing loss or can cause multiple disorders.
Rh Incompatibility	This condition results in the destruction of Rh positive blood cells in the fetus and may cause a number of complications in the newborn, including retardation, cerebral palsy, and epilepsy. Associated hearing loss may range from mild to profound.
Maternal Ingestion of Ototoxic Drugs (e.g.), Salicytes Quinine Streptomycin "Mycin" Drugs	Ototoxic drugs are those which may permanently injure, destroy or retard development of the inner ear, including hair cell damage in the cochlea and absence of auditory nerves. The result is sensorineural loss; however, ingestion of such drugs during the first trimester of pregnancy may also contribute to conductive losses due to malformation of the auditory ossicles. Ototoxic drugs may also produce a number of other congenital abnormalities.
Genetic Disorders (e.g.), Waardenburg's Syndrome Jervel and Lange-Nielsen Disease Usher's Syndrome	These genetic disorders typically result in failure of some portion of the inner ear to reach full development. In the case of the syndromes listed here, for example, membranes within the cochlea do not reach full development and degeneration of the Organ of Corti may be observed.
ACQUIRED	
Bacterial and Viral Diseases (e.g.), Meningitis Measles Mumps Chicken Pox	Sensorineural losses ranging from mild to profound may occur because of direct infiltration of the bacteria or virus to the inner ear. Effects may include destruction of the Organ of Corti, destruction of neural pathways, or damage to other parts of the inner ear.
Ingestion of Ototoxic Drugs (e.g.), Kanamycin Neomycin Gentamycin	Considerable individual variability exists in susceptibility to the ototoxic effects of these drugs. As in the case of maternal ingestion, these drugs affect hearing by destruction of the hair cells in the cochlea.
Head Trauma	Hearing loss due to a concussion may show recovery; however, hearing loss caused by a fracture line through the cochlea, which may result in total deafness, is irreversible.
Noise Induced	Although susceptibility is apparently highly individual, exposure to intense sounds can damage the inner ear and cause hearing loss which may be either temporary or permanent. Firecrackers, noisy machinery, and toy firearms are examples of sounds which may result in sensorineural loss, typically for sounds in the high frequency range.
Acoustic Neuroma	This condition refers to tumors of the auditory nerve. It has rarely been reported in children.

TABLE 2: POSSIBLE CAUSES OF CONDUCTIVE LOSS

ANTENATAL and NEONATAL	
Genetic Disorders (e.g.), Pierre-Robin Syndrome, Treacher Collins Syndrome, Apert's Syndrome, Klippel-Feil Syndrome, Crouzon's Disease	Conductive losses due to genetic disorders typically involve middle ear anomalies such as deformation in the auditory ossicles. Many of these deformities are surgically correctable.
Cleft Lip and Palate	The incidence of recurring middle ear diseases in children with cleft palate is quite high. Middle ear disease such as otitis media (described below) affects the air conduction pathway and may cause conductive losses. Because the associated middle ear disease may have variable effects upon hearing, the hearing of individuals with cleft palate requires regular monitoring.
ACQUIRED	
Tympanic Membrane Perforation	A perforation of the tympanic membrane may result in a conductive loss. Traumas such as blows to the head, or middle ear disease, may cause the perforation. The degree of loss is dependent upon the size and location of the perforation(s). Perforations occasionally heal spontaneously, but often require medical intervention. In all instances, a physician should be alerted.
Otitis Media	Otitis media is a pathological condition of the middle ear and is differentiated into several types. *Serous* otitis media occurs when the eustachian tube is blocked, causing negative pressure and the appearance of fluid in the middle ear cavity. *Supprative* otitis media may be accompanied by sudden ear pain; the pain may subside upon the rupture of the tympanic membrane. In this condition, the fluid in the middle ear cavity is infected. *Chronic* otitis media is a recurrent disease in which middle ear tissues may undergo a repeated cycle of deterioration, healing, and scarring. Discharge from the ear can occur in some states of otitis media. Medical intervention may involve inserting tubes into the ear canal to facilitate drainage and ventilation. The presence of such tubes precludes the use of any hearing aids requiring closed ear molds, as such molds fill the pinna and block ventilation.
Cholesteatoma	Cholesteatoma occurs when skin from the ear canal grows into the middle ear cavity or mastoid through a perforation in the tympanic membrane. The cholesteatoma is susceptible to bacteria and moisture which may cause erosion of bone tissue and other complications.
Impacted Cerumen	Cerumen is ear wax, which may be either wet (yellow to dark brown in color) or dry (powdery whitish scales). Typically, ears are self cleaning, in that the build up of cerumen migrates outward into the outer ear canal, where it can be easily wiped away with a washcloth. If too much accumulates in the canal, however, it can cause hearing loss. Impacted cerumen must always be removed by a physician, as improper attempts may result in damage to the ear canal and/or ear drum. Similarly, removal of foreign objects from the ear canal requires a medical specialist.
Head Trauma	Skull fractures may disrupt the ossicular chain, resulting in a conductive hearing loss; blows to the head may also result in perforation of the tympanic membrane as discussed above.

OVERVIEW OF SENSORY INTEGRATION AND THE SOMATOSENSES

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ERIC

OVERVIEW OF SENSORY INTEGRATION
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What is Sensory Integration?

Sensory integration is the process by which the brain receives information from the senses, organizes and interprets that information, and sends out an appropriate response. Sensor, integration is the process by which the central nervous system matures. It involves sensory receptors, the spinal cord, all parts of the brain and motor effectors.

Sensory integration is only one aspect of human development but it affects all the other aspects. Sensory integration is one function of the brain but it influences the other four major functions (cognition, motor response, vital functions, and emotions).

What Does Sensory Integrative Dysfunction Mean?

Sensory integrative dysfunction is the inability to organize and interpret sensory information and make an appropriate response. Dysfunction is reflected in academic performance, language, postural responses and emotional stability. Sensory integrative dysfunction may be present in learning disabilities, mental retardation, physical handicaps, and emotional disturbance as well as in visual and auditory impairments.

How Does Sensory Integration Therapy Differ From Current Educational Intervention Practices That Might be Used With Children Experiencing These Problems?

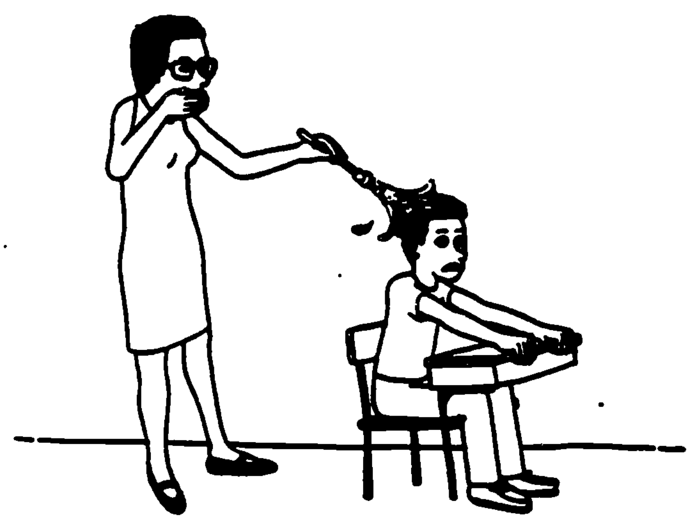
Sensory integration therapy focuses on remediating the underlying deficit within the nervous system rather than the resulting behavioral symptom. For example, one cause of hyperactivity may be tactile defensiveness. Sensory integration therapy focuses on remediating the underlying imbalance between the two components of the tactile system. Educational approaches focus on the behavior of hyperactivity itself.

Sensory integration therapy is not contradictory, but rather complimentary to educational approaches. Both approaches can and should be implemented simultaneously to obtain optimal functioning.

What Cautions Should Teachers be Aware of When Working With Children Who Have Sensory Integrative Dysfunction?

Some general cautions in using sensory stimulation techniques from a sensory integrative viewpoint are:

> Let the child's response be one's guide. Do not impose sensory stimulation on an "unwilling" nervous system. The child's response will let one know when the system is unwilling. Imposing inappropriate sensory stimulation can be disintegrating rather than integrating to the nervous system.



How is Sensory Integrative Dysfunction Treated?

Sensory integration theory is based on research in neurobiology, psychology, and education as well as occupational and physical therapy. Treatment techniques have been developed, based on sensory integration theory. The success of the therapy relies primarily on the two neurobiological concepts of 1. plasticity of the nervous system (i.e., the nervous system can be influenced and changed by external stimuli) and 2. the brain functioning as a whole unit (i.e., influencing one part of the brain can affect another part).

Sensory integration therapy uses intensive, planned, and controlled sensory stimulation. There are two major differences between the type of stimulation used in sensory integration therapy and general sensory stimulation. **General sensory stimulation** provides an enriched multisensory environment that many students can benefit from. The enrichment activities are not case specific. That is, these activities are not planned to remediate individual deficits.

On the other hand, **sensory integration therapy** seeks to develop an appropriate, adaptive response to sensory stimulation (e.g. facilitating head righting in response to vestibular stimulation). The feedback into the central nervous system following a purposeful act such as head righting is more integrating than random sensory stimulation. Sensory integration therapy is case specific. It is planned for an individual child and implemented in a controlled intervention setting.

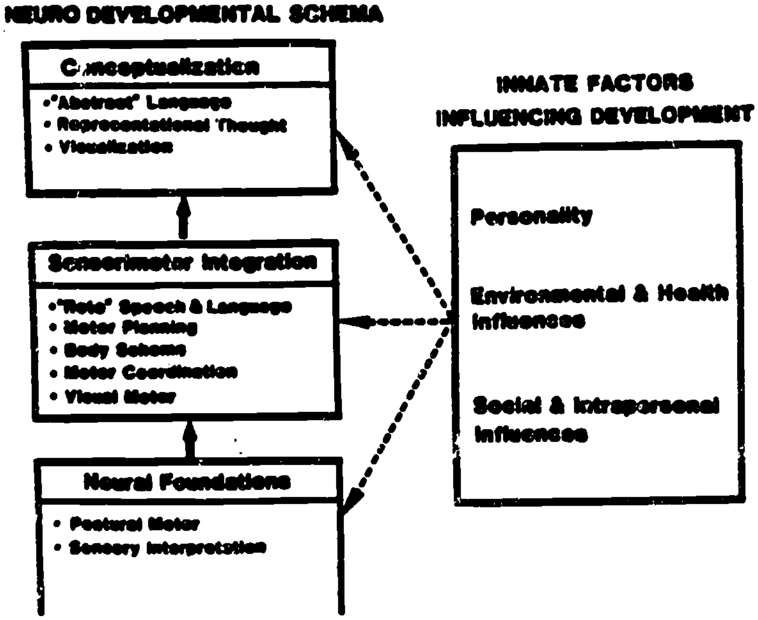
Sensory integration therapy also uses one sensory system to influence another sensory system rather than just stimulating the dysfunctioning system. For example, in tactile defensiveness (an oversensitivity to touch) the therapist not only uses appropriate tactile stimulation, but also can use appropriate vestibular and kinesthetic-proprioceptive stimulation to help reduce the tactile defensiveness. It is possible to use one sensory system to treat another since the brain functions as a whole.

There is a developmental sequence of sensory integration just as there is a motor development sequence leading up to walking. The theory of sensory integration is most concerned with the somatosenses, or body senses, of the vestibular, tactile, and kinesthetic-proprioceptive systems. These systems are explained more fully in the following section.

The other senses (visual, auditory, olfactory, and gustatory) are important but are not used as heavily in treatment of sensory integrative dysfunction. When the somatosenses are functioning adequately, postural responses (muscle tone, integration of primitive reflexes, balance reactions) and ocular responses (visual tracking, visual fixation) can better function.

Continuing in a developmental sequence, the somatosensory systems and postural responses allow motor planning and bilateral integration to develop, which in turn, contribute to eye-hand coordination, language, and form and space perception.

NEURO DEVELOPMENTAL SCHEMA



*Adapted from L. Miller, L. Warren, J. Teachman, 1979.

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Obtain a consultation from an occupational or physical therapist knowlegable in sensory integration prior to initiating sensory stimulation procedures. The functional assessments of the somatosensory systems included in this section can be used to determine which children should receive assessments by a therapist.

Sensory stimulation should be used cautiously, under the supervision of an occupational therapist or physical therapist with children who have increased or decreased muscle tone, seizures, or shunts.

<u>What is the Role of the Occupational or Physical Therapist Using a Sensory Integrative Treatment Approach?</u>

Currently occupational therapists are more likely than physical therapists to have obtained specialized training in sensory integration. However, some physical therapists also have this training. It is recommended that therapists consulting in sensory integration dysfunction, whether occupational or physical therapists, have the necessary specilaized training in this area.

The role of the therapist in consulting with a teacher who has a deaf-blind student would be to assess sensory integration functioning and set up programming to remediate any identified deficits. Ideally, programming should include direct treatment from the therapist. Due to financial constraints, the most frequent type of programming will be done by a teacher in the classroom or home program with monthly monitoring of progress by the therapist.

Before having a child assessed, the following information should be provided to the therapist:

1. Functional assessment of the vestibular, tactile, kinesthetic-proprioceptive systems (checklist and history).
2. Medical and educational history.

3. Information on family background.
4. Suggestions for behavior management, if necessary, to help make the assessment more easily completed.
5. Times of day during which the child functions best.

The report which you receive from the therapist should be written in language comprehensible to a teacher. Unfortunately, therapists often use professional jargon.

Questions teachers should ask of the therapist include: How does the sensory integrative dysfunction interfere with function in the classroom? What behavior responses can one expect to see as a result of the sensory integrative dysfunction? What kinds of sensory stimulation should be used? What kinds avoided? What kinds of progress in sensory integration can be expected?

Once a program has been received from the therapist, be sure to let the therapist know what works and what does not. Let the therapist know if part (or all!) of the program is not feasible in the classroom. For example, there may be problems with time or staffing, available

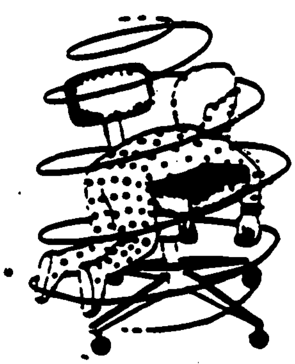
equipment, etc. Work with the therapist to find a compromise. The therapist would rather hear "this cannot be done" than to be misled into thinking programs are being carried out.

OVERVIEW OF SOMATOSENSES (VESTIBULAR, TACTILE, KINESTHETIC-PROPRIOCEPTIVE)

The Vestibular System

The vestibular system enables an individual to detect motion, whether it is motion s/he initiates (e.g., walking), motion imposed on him (e.g., riding in a car) or motion by gravity (e.g., falling). The sensory receptor for the vestibular system is in the inner ear. The receptor responds to head movement in space and to gravity. Fluid within the receptor responds to the head movement and the pull of gravity and stimulates hair cells, sending impulses to the brain. These impulses are received by many sites in the brain, including those monitoring balance, eye movement, muscle tone, vital functions, excitatory level, language processing, visual perceptual processing and emotional function. Vestibular-based sensory integrative dysfunction occurs when these impulses are not organized, interpreted and relayed appropriately to these sites. Vestibular-based dysfunction includes hyporesponsivity, intolerance to movement and gravitational insecurity.

Hyporesponsivity is an undersensitivity to movement, in which there is not a normal dizzy response to movement. Prolonged spinning, for example, would not result in the normal nausea or dizziness. Children with hyporesponsivity to vestibular stimulation are often disoriented in space. these children may crave movement and may

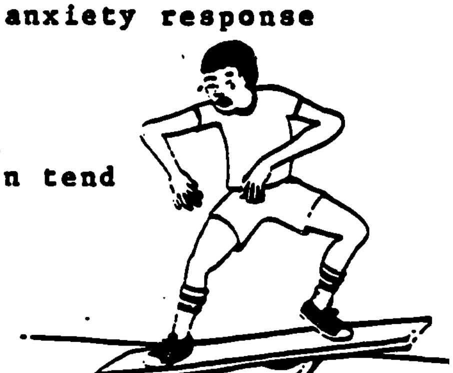


Precaution: For illustration purposes. Do not use spinning.

self-stimulate by rocking, twirling, etc. Toe-walking in the absence of heel-cord spasticity, often reflects this hyporesponsivity. Appropriate sensory stimulation for vestibular hyporesponsivity includes movement in all planes (orbiting rather than spinning and linear). Cautions for this sensory stimulation include constant monitoring of breathing and skin tone: discontinue if breathing rate increases or decreases, child flushes, blanches, or perspires heavily. It is best to let the child move him/herself on equipment rather than imposing stimulation passively. Ear infections appear to temporarily decrease tolerance of movement. Recommended equipment includes platform swing, net hammock, rocking chair, Sit N Spin.

Intolerance to movement is an oversensitivity to movement such that a less than normal amount of movement (especially rotary) may make the child dizzy or nauseous. Children with intolerance to movement are fearful and cautious of movement stimulation. Nausea and vomiting may occur with seemingly minimal amounts of stimulation. Appropriate sensory stimulation for intolerance to movement includes linear (up-down, forward-backward) movement rather than orbiting, only when tolerated, and kinesthetic-proprioceptive stimulation (e.g., battery vibration, weight cuffs, jumping activities). Cautions include not imposing any movement if child is unwilling. Recommended equipment includes scooter ramp, platform swing and net hammock used only for linear movement, rocking chair, mini-trampoline, battery vibrator, 1/2 lb. weight cuffs.

Gravitational insecurity is a fear or anxiety response to being out of the upright position or having the feet off of the ground. Unlike intolerance to movement which can be observed as a physiological reaction. These children tend to cling to external support, fear heights or playground equipment, and to move cautiously and rigidly. Changes in position imposed on them

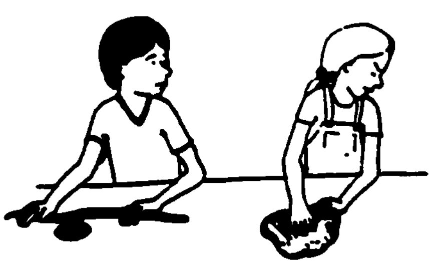


are upsetting. Appropriate sensory stimulation for these children is similar to that for intolerance to movement. Cautions include keeping the child in an upright position on the equipment until the child indicates a readiness to move out of the upright position.

The Tactile System

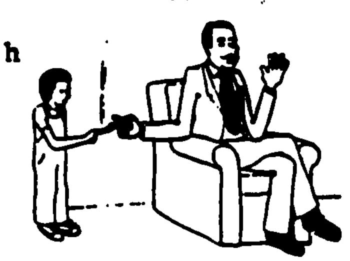
The tactile system enables an individual to discriminate that s/he has been touched, where s/he has been touched, and what is touching him/her. The sensory receptors for the tactile system are in the skin. The hair follicles respond to light moving touch and set up impulses for the protective component of the tactile system. Other receptors called mechanoreceptors respond to deeper touch-pressure and set up impulses for the discrimination component of the tactile syustem. In a mature nervous system, these two components of the tactile system have a balanced interaction, with the discriminative component predominating. **Tactile-based sensory integrative dysfunction** occurs when these two components are out of balance. Tactile-based dysfunction includes tactile defensiveness and inadequate tactile discrimination.

Tactile defensiveness (oversensitivity) is an unusual degree of discomfort when touched, either by human touch or by textures. These children may appear withdrawn or aggressive, in an attempt to avoid touch. They may be hyperactive or distractible. They may react negatively to textures such as finger paint, water or sand play, and other "messy" substances. Heat and humidity aggravate these negative reactions, as does being touched from behind or unexpectedly. Appropriate sensory stimulation for these children includes deep touch pressure (e.g., massage, rolling a therapy ball over them), slow vestibular stimulation (e.g.,platform swing, net hammock, rocking chair), and kinesthetic-proprioceptive stimulation (battery vibrator, weight cuffs, jumping). Cautions include not touching unexpectedly, using deep touch rather than light touch,



not forcing touch on the child and trying to reduce heat, humidity and drafts.

Inadequate tactile discrimination (undersensitivity) is difficulty perceiving touch. These children may be unaware of being touched (including pain and temperature), may be unable to localize where they have been touched or may be unable to identify objects by touch. Tactile discrimination is important for motor skills, so these children may have difficulty especially with hand skills. These children may engage in tactile self-stimulation, such as head-banging, biting, scratching, etc. They may mouth objects frequently, since tactile receptors are more sensitive in the mouth. Appropriate sensory stimulation includes a wide variety such as, massage, finger painting, sand and water play, "feelie bags", clay, etc. Cautions include not overloading the tactile system (observe for increase in activity level) as well as allergic reactions to materials.



The Kinesthetic Proprioceptive System

The kinesthetic-proprioceptive system enables an individual to detect where his/her extremities are in space and, if the extremities are moving, in what direction. Receptors are located in the muscles, joints and tendons. They respond to stretch (traction), compression (approximation), and vibration.

Kinesthetic-proprioceptive based sensory integrative disorders include low muscle tone (floppy muscles). These children are often clumsy, fall frequently and fatigue easily. They may require visual cues for movement. Appropriate sensory stimulation includes kinesthetic-proprioceptive stimulation (battery vibrators, weight cuffs, jumping), tactile stimulation (rubbing with washcloths), and vestibular stimulation (swinging, rocking chair, etc.). Cautions include not to fatigue muscles but to provide arrhythmic, vestibular stimulation rather than rhythmical, monotonous stimulation.

References

Ayres, A. Jean. (1972). Sensory integration and learning disorders. Western Psychological Services: Los Angeles.

Ayres, A. Jean. (1979). Sensory integration and the child. Western Psychological Services: Los Angeles.*

Clark, Pat N. and Anne S. Allen (ed.). (1985) Occupational therapy for children. C.V. Mosby Co.: St. Louis.

*This book is recommended reading. It was written for parents and teachers.

ERIC

USING TOYS AS LEARNING TOOLS WITH THE DEAF-BLIND CHILD

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USING TOYS AS LEARNING TOOLS WITH THE DEAF-BLIND CHILD

INTRODUCTION

Selecting playthings for students whose deaf-blindness precludes enjoyment of the characteristics around which the toy was designed is a potentially frustrating activity. Educators and parents of deaf-blind youngsters continue to pursue the dream of discovering toys specifically for this unique population. Waiting for the advent of specially-designed toys is a luxury deaf-blind children cannot afford. Parents and educators must be informed in how to expend their time and money in the purchase of toys that promote learning opportunities from interactions both with people and settings in which they will function. These consumers should select toys based on variables other than color, aesthetic appeal, characters currently in vogue, or intended play behaviors. Each deaf-blind child's personal uniqueness will dictate how to address these variables and, consequently, while toys can be recommended, no generic list of "deaf-blind" toys can be generated if toys are truly to serve as learning tools.

Targeting toys that will be effective is an art that is dependent on four interrelated skills. The consumer must: 1) be thoroughly familiar with the child's developmental and sensory abilities and learning style, 2) have some knowledge of the sequence of various aspects of child development, 3) understand how to analyze the developmental qualities of the toy and 4) be creative in adaptation or modification of the toy as well as in generating expected behaviors using the toy in a playful interactive style. A set of guidelines designed to assist consumers in purchasing toys that will afford optimal play experiences is included at the end of this article.)

The most difficult and the most critical aspect of toy selection is matching the quality of the toy's features to the child's tolerance and processing level for those qualities so as to encourage active exploration and minimize inappropriate manipulations. If a toy is in concert with the developmental and sensory needs of the deaf-blind child, the frequency of self-stimulatory and stereotypic behaviors may be reduced or even prevented.

RECEPTOR REFERENCE AND SENSORY STIMULATION

Sensory stimulation, traditionally and unfortunately, has followed the concept that more is better. "Bombardment" of the handicapped child with lights, textures, and sounds has been an approach too commonly emphasized. The "sensory stim" approach has been particularly popular with severely involved children who demonstrate minimal responsiveness to their environment. Such efforts are intended to arouse and interest the child and, therefore, entice him to interact with toys and people. Toys and play materials should be selected and applied with an understanding of an individual child's central nervous system integrity and response to various types and levels of sensory input. Day (1982) emphasized that children at risk for abnormal development may be put at greater risk if confronted with inadequate or inappropriate stimulation. Largo and Howard (1979) found that the most beneficial results of an interaction were realized when the sensory characteristics of the play materials and demonstrated play matched the child's development level. Kolko, Anderson, and Campbell (1980) reported a significant relationship between the developmental level of the child and the amount of stimulus information he processed.

An understanding of sensoristasis (Schultz 1965) and of the developmental hierarchy of sensory processing is essential when selecting and using toys with sensory and physically impaired children. Schultz (1965) defined sensoristasis as the optimal level of arousal for processing information. When arousal is too high, an individual will attempt to reduce it; when too low, he will try to raise arousal level. This theory has been associated with children who engage in self-stimulatory activities (Lewis, 1978) and with children who have been labeled "tactilely defensive" (Larson 1982). Lewis (1978) discovered that high arousal levels lead to disorganized behavior while low arousal levels lead to sluggish behavior.

Arousal levels can be heightened with toys that are novel, contain surprises, and present incongruities and complexity in visual and tactual components (Kielhofner, Barris, Bauer, Shoestock, & Walker, 1983). Clune, Paolella, and Foley (1979) suggested that a child's interest is more readily elicited if toys present an interesting difference between what is familiar and what isn't. Others have pointed out that toys used too frequently or for too long lose their novelty and potential to arouse a child. Caution must be

exerted with this element of novelty. Ferrara and Hill (1980) reported that normal infants displayed negative affect such as increased arousal and avoidance of stimuli when the novel environment was too difficult.

Initially, children appreciate proximal stimuli. Schopler (1966) found that younger children were more accurate in tactile-kinesthetic localization than in visual localization and that the trend from tactile to visual receptor preference occurs with increasing neurological maturity. Murphy (1982) also reported a decrease in near receptor (vibration) preference and an increase in preference for distance receptors (sight and sound) as mental age increased. Danella's (1973) research with deaf-blind indicated that vibration was the most preferred sensory input while fur and yarn were the least preferred. No significant differences emerged in preferences for hot, cold, wood, or sand. Danella explained that light touch (fur and yarn) was threatening to immature nervous systems while vibration related to pressure and proprioception. She theorized that proprioceptive input activates the discriminative component of touch and inhibits the protective component. Children who are tactually defensive maintain protective touch and respond more favorably to pressure, firm touch, and vibration (Bailey and Meyerson, 1969; Danella, 1973; Larson, 1982; Lewis, 1978; Murphy, 1982; Resman, 1981; and Watters and Wood, 1983).

Normal infants of nine to fifteen months increased exploratory activity, duration of plan, and latency of response when toys combined the attributes of configural complexity, sound potential, and variability of form (Wehman, 1976). Rosenberg and Butler felt that some sound toys were subsequently avoided if they emitted adverse high-frequency sounds. Knight and Rosenblatt's (1983) research with deaf-blind and multihandicapped children indicated that bimodal sensory presentation impaired processing capabilities. While light was a more effective reinforcer than sound, deaf-blind children exhibited poorer auditory selectivity in the presence of light.

Awareness of the influence of sensory stimulation on a child's responsiveness, can result in more appropriate selection and adaptation of toys. It can also facilitate a child's manipulation of and subsequent learning from the toy. Murphy (1982) felt that appropriate sensory stimulation had significant advantages over other forms of reinforcement. When Murphy's sensory hypotheses are applied

to toys, the toy can serve as an intrinsic motivator and reinforcer in and of itself. Murphy (1982, p 275) suggested that sensory stimulation provided:

* for ease of delivery
* for a slow rate of satiation
* for unlimited variability
* convenience for children with dietary restrictions and feeding deficits
* for a more effective means than food or social praise
* for a more appropriate option for children who are unresponsive to praise, refuse edibles and engage in a high rate of undesirable behaviors
* for possibilities to automate equipment (toys) that would provide sensory stimulation contingent on a particular response

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TOY QUALITIES

Two major attributes that have proven to be effective in motivating children with combined visual and auditory deficits to attend to or maintain interaction with toys are:

1) The actions of the toy provides desired sensory input.
2) Actions are unpredictable and contingent on active manipulation. Regardless of the extent of sensory or cognitive deficit, the single most consistently preferred quality available in toys has been vibration.

Toys that alter form in some way encourage a child to explore and change as dictated by the motion of the toy. FMT's plastic tubular Tangles and the Roll Bot by Battat are excellent examples of toys that provide varied sensory input and require continual change on the part of the child. It is well documented that novelty sustains attention longer than any other factor.

Bright colors of deep hues, particularly reds, oranges, and yellows are quite appealing. Fluorescent greens, pinks, and oranges and colors that glow under black light are motivating not for the colors themselves, but because of the intensities of the contrast available to a child with limited and distorted vision. Orange against a blue blackground and yellow against a black background are contrasts to which deaf-blind children respond effectively.

Visual displays that change are particularly appealing as are reflective surfaces. Rhythmical visual patterns such as spinning concentric circles or stripes are most enticing to deaf-blind children. Among the most exciting to deaf-blind children are toys that manifest unpredictable changes when manipulated such as plastic slinkies, magic sand windows, materials that contain pressure sensitive liquids, Magic Wands or Space Tubes with glitter and stars that form different patterns.

The element of surprise can very often facilitate visual following and scanning. Discovery Toys Pop-Up-Cone is a stacking toy that projects the stacked hemispheres with the push of a lever. The child must scan around the area to locate the plastic parts in order to stack them again.

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[illegible] toys requiring the [illegible] are designed to [illegible] the child to activate the action and to track both horizontally and vertically. Many of the mechanical toys [illegible] are super for visual [illegible] of auditory localization, [illegible] compensation and even weight shift for [illegible] in and out of static postures.

Toys with sounds that can be varied in frequency, pitch, duration, and rhythm are intriguing to many deaf-blind with residual auditory hearing. Auditory toys often contain mechanisms that provide vibration and numerous battery operated toys give both auditory and vibratory sensations that deaf-blind children find pleasurable.

The use of "age appropriate" materials with severely handicapped students has been widely advocated (Brown, [illegible], 1980 and [illegible], 1979). While the concept has merit, the interest and functioning levels of the child must also be considered to ensure that the materials are motivating (Van Dijk, 1983). If characteristics that appeal to the child are available in a toy considered "age-appropriate" that, of course, is the most desirable situation. The goal of each and every interaction between a deaf-blind child and a toy should be the achievement of a more refined or sophisticated level of play which, eventually, will progress to communicative exchange and adaptation to the environment.

Cause-effect toys that afford a variety of manipulations and toys that produce an immediate physical change with a minimum of contact are popular among deaf-blind children.

Playthings that offer strong proprioceptive feedback and that provide vestibular input and gross motor experiences are not only highly desired but also facilitate the deaf-blind child's awareness of his position in space and his relationship to the surroundings while developing upper and lower body coordination. Trampolines, swings, hammocks, [illegible], see-saws, gliders, scooters, Big Wheels, etc. are all appropriate means of acquiring the same input deaf-blind children seek through repetitive stereotypic behaviors (e.g., spinning, rocking, swaying, twirling, head [illegible], etc.). [illegible] (1981) suggested that stimulus events that proved reinforcing to children with autistic characteristics produced similar sensory effects to those produced by the child's own stereotyped mannerisms. Such children seem to be interested in toys manifesting similar

effects to those created by self-stimulatory activities but toys lacking such qualities did not sustain attention (Murphy, 1982).

Many toys that enhance visual-motor and spatial organization skills can serve as a leisure skill as well as be used for prevocational training. These toys are particularly relevant for adolescent students who function at the sensorimotor level. McLean, Snyder-McLean, Rowland, and Jacobs (1981) have designed an excellent set of materials for fostering leisure and prevocational skills with commercial and teacher-made games through social-communicative strategies. The Ho'onanea Project (1982) describes specific toys and games that were found adaptable for use with older severely handicapped students. Judicious selection of common childhood games and of components of sports activities may enable the deaf-blind child to engage in partial participation (Baumgart, Brown, Pumpian, Nisbet, Ford, Sweet, Messina, & Schroeder, 1982) while facilitating communication and social interaction skills.

Laser swords, the plastic tubing that is illuminated "Darth-Vader" style, can be used in dimly lit rooms by deaf-blind students as a fencing activity. The laser light also is effective as a bat in striking Whamo's Fireball for a game of baseball. White whiffle balls under blacklight conditions make wonderful striking targets with plastic bats striped concentrically with biker's fluorescent tape. Tossing balloons into which lumin socks have been inserted into white plastic trash cans illuminated by blacklight can be a foundation for more advanced basketball games. The simulated swords, bats, and basketball "hoops" all can be considered indirect tools for achieving desired ends: a skill easily mastered by 18 month-old infants. Day-glo colored construction blocks are fascinating under blacklight, either for sorting of copying a simple pattern. Tomy's Lights Alive can be used to teach imitation, discrimination, spatial organization and seriation while the more traditional Lite-Brite can be arranged so that the student must follow a specific color or spatial pattern and the more sophisticated communicator must "request" a specific peg from the adult via a signal, gesture or sign.

When the level of play is identified for each individual, group games and board games can easily be adapted to permit each child to participate in the game. Specific games can be selected that afford a variety of interaction levels for

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students representing wide ranges of functional vision and hearing. Hungry Hippos by Hasbro is a game of this nature. Four players each select a toy hippopotamus attached to a square playing frame. The object of the game is to earn the greatest number of marbles by having your hippo "eat" them by depressing a lever on his back that opens and projects the mouth forward to grab the marbles.

The following figure suggests how each of four different levels of deaf-blind children can be encouraged to engage in cooperative play while simultaneously developing behaviors appropriate to their learning and sensory levels.

Design of Group Interaction with Table Frame

STUDENT	OBJECT PLAY	MANIPULATIVE	VISUAL	AUDITORY	EXPECTED RESPONSE
A	Undifferentiated	Gross fisted motion	LP OU	Profound bilateral loss	Repetitively pushes adapted lever with adult assistance
B	Differentiated	3 jaw chuck grasp	20/200 OD LP OS	Severe loss Bilaterally	Push lever to open Hippo's mouth
C	Anticipated Regulation	Isolated finger movement	20/200 OU	High frequency Sensorineural loss	Push lever to purposefully trap trap a specified color of marble
D	Symbolic	Bilateral oppositional	LP OU	Moderate to severe conductive loss	"Feeds" marble into hippo's mouth by opening mouth and placing marble in it

Similarly, games such as Simon can be used to reinforce social prerequisites for communcation while building fine motor and preverbal communication exchange behaviors. Turn taking, initiating interactions, and imitation all can be incorporated into the "game playing" situation. Attention to even an indiscriminate wiggle can gradually enhance a child's awareness of his ability to affect his control on others: "Oh, Ryan you want a turn?" By assisting Ryan to activate a colored panel he learns that movement, (i.e., the wiggle can be used as a means to something pleasurable rather than as an end in itself). Attention to a different behavior in the presence of another toy fosters the child's understanding that "everything has a name" and that different activities produce different results. Thus, a vocabularly of means for initiating and responding in a social situation is developed into a meaningful, albeit, idiosyncratic, communication system for that child.

CHILD BEHAVIORS:

Langley (1985) designed a set of questions to be addressed when attempting to match the child's response mode and processing abilities with an appropriate toy:

1. Can the child independently enjoy the toy or must an adult or peer assist him?
2. Are the child's strength, flexibility, and coordination sufficient to operate the toy?
3. Can the toy be adapted to better accommodate the child's auditory and visual acuity/efficiency, movement possibilities, postural control and level of tactile/proprioceptive integration?
4. Will the toy permit the child to obtain varied tactual, visual and auditory perspectives when positioned in different orientation?
5. Will the toy minimize the effects of the visual and auditory deficits?
6. Will the toy allow for cognitive mastery or successful physical control?
7. Will the toy facilitate extended exploratory behavior?
8. Will the child have to maintain visual/auditory or tactual contact in order to operate or enjoy the toy?
9. Can the toy elicit a range of developmental behaviors so as to facilitate acquisition of progressively more complex skills while simultaneously reinforcing targetted skills?

Adapting toys for deaf-blind children is a process that consists of far more than altering the basic material format. When one is familiar with the pacing, intensity levels, duration of tolerance, and physical orientation of the toy the child can accommodate, the same plaything can afford multiple experiences for a wide range of children.

Two toys haved been analyzed by developmental components and teaching suggestions have been incorporated within each domain as a means of exemplifying how toys can be applied across handicapping conditions and developmental levels. (See Appendix.) The consumer must be aware that any toy's use is dictated only by the adult's imagination, knowledge of development, and preconceived notions of the toy's "purpose". A toy is only as effective as the adult's ability to match qualities of the toy with the child's style of learning, and cognitive, sensory, motoric, and social communicative needs.

PRIORITY RATING SCALE FOR TOY SELECTION

	Yes (1 point)	No (0 points)	Comments
Toy: Name Manufacturer Age range stated on box Description Cost			
1. What is toy designed to foster? cognitive fine motor gross motor communication/language sensory self-care/independence socialization			
2. Is it chronologically age-appropriate?			
3. Will it be motivating given cognitive level? sensory level? motor level?			
4. Is the child ready cognitively? motorically? sensorially? socially? linguistically?			
5. Can the toy be used contingently?			
6. Can the toy be adapted to a different level of play? for a different purpose of play? via physical orientation of toy/child? via addition to or modification of original construction? for a different response mode?			
7. Does it provide different experience(s) as a toy already in the classroom/home?			
8. Will the toy be durable given consistent play for a minimum of six months?			
9. Is the toy safe?			
10. Can it eventually foster more complex behaviors?			
11. Is the cost of the toy worth its potential play experience given your current financial status?			

TOTAL

USING TOYS TO TEACH SKILLS IN COGNITIVE DOMAINS

Toy: Gloworm

Adaptation: vibration, music

Object Permanence	Means-Ends	Construction Object Space
Child retrieves toy when only tail exposed from under or behind a barrier	Child reaches for toy when activated when hand and toy simultaneously in view	Child manipulates face-end of gloworm
Child retrieves toy from under or behind opaque barrier when toy lit	Child grasps toy to bring it to face or mouth	Child rotates toy to find face when given face-down
Child removes toy when placed under or behind a barrier when music activated	Child reaches around trans-luscent barrier to retrieve toy	Child rotates toy to find activating mechanism
Child searches for toy when body secluded behind one of several barriers and intermittently lit with face exposed	Child pushes toy in attempt to activate	Child reaches into deep container to retrieve toy
Child searches for toy when secluded behind one of several barriers when music activated	Child searches for spot to activate toy	Child retrieves toy by rotating deep container to retrieve toy
Child searches for worm when placed inside shoe	Child moves to reach toy positioned out of reach	Child reaches around cul-de-sac to retrieve toy

Vision	Hearing	Touch/Pressure
Child opens eye to gaze at lit toy	Child demonstrates behavior pattern indicating music heard	Child allows gloworm to be positioned on body
Child orients to toy when lit and presented peri-pherally	Child holds worm to ear or temple	Child seeks vibration of toy
Child orients to locale of toy when lit and moved within central visual field	Child orients laterally to sound	Child prefers face to body of gloworm
Child localizes toy when activated intermittently	Child orients to sound below shoulders, above shoulders, behind trunk	Child maintains grasp on toy placed in hand
Child tracks lit gloworm with saccadic movements	Child attempts to reactive sound once heard	Child attempts to reactivate toy by continuing to push when guided
Child tracks lit gloworm with smooth movements when moved in 360° arc	Child locates worm when activated within a five foot distance	
Child tracks unlit gloworm with saccadic		
Child tracks unlit gloworm with smooth movements		

(continued)

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Toy: Gloworm

Adaptation: vibration, music

Upper Extremity Scapula Stability	Hand Function	Motor Planning
Child extends arm and wrist to activate toy placed vertically	Grasps toy with palm	Child maintains pressure to activate toy
Child sidesits and extends arm to activate toy positioned on floor	Isolates one or more fingers to push toy or explore face of toy	Child imitates activation of toy
	Holds toy with both hands to view or offer	Child activates toy when positioned differently or at a different height
	Holds toy with one hand and activates with other	Child discovers which switch activates adapted gloworm when presented with two
	Transfers toy from one hand to other	
	Supinates and pronates forearm to view gloworm's face	
	Grades control of hand to evoke appropriate pressure to activate toy	

Social Prerequisites	Dyadic Interaction (Two Person)	Imitation/Symbolic Behaviors
Social causality	Child looks at or touches toy when adult offers	Child imitates activation of toy
Child increases/decreases movements/vocalizations with activation of toy	Child looks at or touches toy when adult points to it as opposed to another toy	Child hugs toy
Child exhibits consistent movement pattern as termination of toy	Child "helps" adult activate toy	Child kisses toy
Child reaches toward toy when activated	Child initiates interaction with adult to acquire toy	Child uses toy as pillow
Child pushes adult's hand to activate toy	Child waits turn to activate toy	Child uses toy as light to see another toy
Child taps adult to reactivate toy	Child fills turn to activate toy	Child feeds worm with spoon
Child pushes adult's hand toward toy		Child feeds worm with stick
Child gives toy to adult		Child "dances" with worm
Child points to toy to acquire or have activated		Child plays hide n' seek
Child pulls adult to toy		

USING TOYS TO TEACH SKILLS IN COGNITIVE DOMAINS

Toy: Dobie Sound Puzzle

Adaptation: dycem matting or decoration putty

Description: Cylindrical Puzzle with three transparent cylindrical chambers each of which respectively accomodates a square, a triangular, and a hexagon shaped puzzle piece that emit a whistle as they descend.

Vision	Hearing	Touch/Pressure
Child fixates on transparent form	When penlight passed back and forth behind chambers	Child tactually explores transparent tube
Child brings transparent form to eyes when lit penlight dropped into one of the cylinders in a dimly lit room	Child demonstrates behavior pattern that indicates aware of sound as puzzle travels through chamber	Child allows transparent tube to be rolled on trunk or extremity
Child orients to toy when rotated rapidly in peripheral field	Child orients laterally to sound below above behind body	Child shapes hand around chamber
Child tracks tube with saccadic movements	Child localizes toy when activated within five feet out of view	Child shapes hand around individual puzzle piece
Child tracks tube with smooth movements	Child reactivates toy in order to hear sound	Child explores chambers
Child shifts gaze between two puzzle pieces	Child imitates number of pieces dropped through chambers	Child matches puzzle piece with appropriate chamber
Child converges on puzzle piece		
Child orients to puzzle piece activated in peripheral fields		
Child tracks puzzle piece with saccadic movements		
Child tracks puzzle piece with smooth movement		
Child locates puzzle form (transparent tube) when rolled within five feet		
Child tracks light presented from left to right through transparent tube		
Child tracks puzzle piece vertically through tube		

(continued)

Toy: Dobie Sound Puzzle

Object Permanence	Means-Ends	Construction Objects in Space
Child pulls sound puzzle piece out when top only is exposed	Child attempts to activate toy by releasing puzzle piece into chamber	Child shifts gaze between two puzzle pieces
Child uncovers sound chambers when cloth is draped to conform to shape	Child grasps puzzle piece when toy and hand both in view	Child reaches to take puzzle piece with accuracy
Child retrieves sound chambers from under or behind solid barrier when cued by sound	Child grasps puzzle chambers when hand and toy simultaneously in view	Child releases puzzle pieces into a container
Child retrieves sound chambers from under or behind solid barrier without sound cue	Child takes puzzle piece in each hand	Child attempts to associate puzzle piece with sound chamber
Child displaces one barrier to retrieve toy (puzzle piece)	Child releases one puzzle piece to take second	Child releases hold on puzzle piece once in chamber
Child selects one of two barriers under which puzzle piece hidden	Child transfers puzzle piece from one hand to other	Child reverses chamber to locate open end
Child searches under or behind barriers to retrieve puzzle piece	Child removes transparent cover to retrieve puzzle piece or tries to shake puzzle piece out of chamber	Child rotates chamber to shake out puzzle pieces
Child searches for puzzle piece when hidden by a barrier when displaced invisibily	Child takes third puzzle piece when offered by switching second one to other hand	Child rights puzzle piece to place in sound chamber
Child searches for puzzle piece when invisibly placed under one or many barriers when invisibily displaced	Child pulls cloth to reach sound chamber	Child reaches around shelf or chair to reach toy
Child searches for puzzle piece when invisibly placed under one of three containers	Child pulls string to horizontally retrieve chamber	
Child searches closed containers in order to locate all pieces in order to place them in sound chambers	Child pulls string vertically to retrieve sound chamber	
Child searches for toy in visual storage place in classroom	Child moves position to retrieve toy rolled out of reach	
Child searches for toy when not in visual place in classroom	Child attempts to match through trial and error puzzle piece to sound chamber	

(continued)

Toy: Dobie Sound Puzzle

Social Causality	Dyadic Interaction (Two Person)	Imitation/Symbolic Play
Child exhibits consistent reponse when puzzle piece dropped into sound chamber	Child maintains hold onto sound chamber simultaneously with adult	Child pats sound chamber
Child touches toy to request reactivation	Child engages in pushing and pulling with adult with sound chamber	Child taps together two puzzle pieces
Child touches adult's hand to request reactivation	Child looks at or touches sound chamber when adult indicates chamber as opposed to second toy present	Child wiggles sound piece on finger
Child pushes adult's hand to toy to reactivate	Child initiates interaction with adult by touching or tugging adult to request activation of toy	Child imitates tapping puzzle piece across table
Child pushes toy to adult to reactivate	Child waits as adult releases toy into sound chamber	Child taps sound chamber with puzzle piece
Child hands toy to adult to request reactivation	Child fills turn by releasing puzzle into sound chamber	Child "kisses" two puzzle pieces
Child gives puzzle piece to adult to request activation of toy	Child maintains interaction by rotating chamber and handing puzzle piece to adult	Child uses sound chamber as drum
Child points to toy to retrieve		Child uses sound chamber as steering wheel
Child pulls adult to retrieve toy		Child uses sound chamber as car to ride animal sound pieces
		Child uses sound chamber to knock over animal pieces (bowling)

(continued)

Toy: Dobie Sound Puzzle

Scapular Stability	Bilateral Control	Unilateral Control	Motor Planning
Child sits one arm extended to take weight, other hand places puzzle	Child picks up sound chamber with two hands	Child grasps individual chamber in palm	Child accurately aligns puzzle piece with respective sound chamber recess
Child rolls chamber up wall when chamber positioned horizontally	Child turns sound chamber over with two hands to shake out puzzle pieces	Child grasps individual puzzle piece with fingers against palm	Child problem solves how to orient sound chamber in order to fit puzzles
Child stand against table to support weight on extended arm while opposite hand places puzzles in chambers	Child supinates palms to push sound chamber or to "catch" chamber when rolled to child	Child grasps individual puzzle piece with lateral pinch	Child places puzzle pieces accurately without under or over reaching
	Child reciprocally pats chamber alternately with each hand (as in beating drum)	Child grasps individual puzzle piece between thumb and fingers	
	Child pushes chamber back and forth between hands when chamber positioned horizontally	Child grasps individual puzzle piece between thumb and index finger	
	Child can hold chamber with one hand while placing puzzle with opposite hand	Child explores chambers with one or two fingers	
	Child can maintain grasp on one puzzle piece while reading for a second puzzle piece with opposite hand	Child supinates forearm to look at puzzle piece	
		Child supinates forearm to shake out puzzles from sound chamber	
		Child releases puzzles when resting hand on top of chamber	
		Child releases puzzles with hand above sound chamber	
		Child extends wrist to place puzzle piece in chamber when chamber presented horizontally at shoulder level	

RFFERENCES

Bailey, J., & Meyerson, L. (1969). Vibration as a reinforcer with a profoundly retarded child. Journal of Applied Behavior Analysis, 2, 135-137.

Baumgart, D., Brown, L., Pumpian, I., Nisbet, J., Ford, A., Sweet, M., Messia, R., & Schoeder, J. (1982). Principle of partial participation and individualized adaptations in educational programs for severely handicapped students. TASH Journal, 7, 17-27.

Brown, L., Falvey, M., Pumpian, I., Baumgart, D., Nisbet, J., Ford, A., and Loomis, R. Curricular strategies for teaching severely handicapped students functional skills in school and nonschool environments (Vol. 10). University of Wisconsin-Madison and Madison Metropolitan School District, 1980.

Clune, C., Paolella, J. M., & Foley, J. M. (1979). Free play behavior of atypical children: An approach to assessment. Journal of Autism and Developmental Disorders, 9 (1), 61-72.

Danella, E. A. (1973). A study of tactile preference in multiply-handicapped children. The American Journal of Occupational Therapy, 27 (8), 457-463.

Day, S. (1982). Mother-infant activities as providers of sensory stimulation. The American Journal of Occupational Therapy, 36 (9), 579-585.

Falvey, M., Ferrara-Parrish, P., Johnson, F., Pumpian, I., Schroeder, J., and Brown, L. (1979). Curricular strategies for generating comprehensive, longitudinal and chronological age-appropriate functional individual vocational plans for severely handicapped adolescents and young adults. In L. Brown, M. Falvey, D. Baumgart, I. Pumpian, J. Schroeder, and L. Gruenwald (eds.) Strategies for teaching chronological age-appropriate functional skills to adolescent and young adult severely handicapped students, (Vol. 9, Part 1). Madison, WI: Madison Metropolitan School District, 102-161.

Ferrara, C. & Hill, S. D. (1980). The responsiveness of autistic children to the predictability of social and nonsocial toys. Journal of Autism and Developmental Disorders, 10 (1), 51-57.

Kielhofner, G., Burris, R., Bauer, D., Shoestock, B., & Walker, L. (1983). The American Journal of Occupational Therapy, 37, (5), 305-312.

Knight, M. S., & Rosenblatt, L. (1983). The effects of bimodal (soundlight) stimulus presentation on selective responding of deaf-blind multihandicapped children. American Annals of the Deaf, 128, (3), 397-401.

Kolko, D. J., Anderson, L., & Campbell, M. (1980). Sensory preference and overselective responding in autistic children. Journal of Autism and Developmental Disorder. 10 (3), 259-271.

Langley, M. B. (1985). Selection, adaptation & application of toys as learning tools for children with sensory and physical handicaps. In Neisworth, J. (Ed.) Topics in Early Childhood Special Education.

Largo, R. H. & Howard, J. A. (1979). Development progression in play behavior of children between nine and thirty months. I: Spontaneous play and imitation. Developmental Medicine and Child Neurology, 21, 299-310.

Larsen, K. A. (1982). The sensory history of developmentally delayed children with and without tactile - defensiveness. The American Journal of Occupational Therapy, 36 (9), 590-596.

Lewis, B. J. (1978). Sensory deprivation in young children. Child: Care Health and Development, 4, 229-238.

McLean, J. E., Snyder-McLean, L., Jacobs, P., & Rowland, C. (1981) Process-oriented educational programs for the severely-profoundly handicapped adolescent. Parsons, KS: Bureau of Child Research Center.

Murphy, G. (1982). Sensory reinforcement in the mentally handicapped and autistic child: A review. Journal of Autism and Developmental Disorders, 12 (3), 265-278.

Resman, M. H. (1981). Effects of sensory stimulation on eye contact in a profoundly retarded adult. American Journal of Occupational Therapy, 35 (1), 31-35.

Rosenberg, R. A., & Butler, R. A. (1982). Sound as a reinforcer for infants' manipulation of toys:

[illegible], 11, [illegible].

[illegible], [illegible]. ([illegible]). Visual versus tactual receptor performance in normal and schizophrenic children. [illegible], 71, 108-114.

[illegible], [illegible]. ([illegible]). [illegible]. [illegible], [illegible] [illegible].

[illegible], [illegible]. ([illegible]). Assessment of the deaf-blind student. Workshop presented for Florida Association of [illegible]. Tampa, Florida June 17 - June [illegible].

[illegible], [illegible], & [illegible] ([illegible]). Play and self-stimulatory behaviors of autistic and other [illegible] children with different [illegible] of toys. The Journal of Special Education, [illegible] ([illegible]), [illegible].

[illegible], [illegible]. ([illegible]). Selection of play materials for the [illegible]: a continuing dilemma. [illegible], [illegible] ([illegible]), [illegible].

[illegible], [illegible], & [illegible] ([illegible]). [illegible]. [illegible] Publishing.

ORIENTATION AND MOBILITY FOR DEAF-BLIND CHILDREN: IMPLICATIONS FOR TEACHERS PARAPROFESSIONALS AND PARENTS

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The content of this paper is based upon ideas of Hill, Rosen, Correa, and Langley (1984). The Hill et al. paper describes the theoretical and philosophical framework for the Preschool O&M Project, Grant #G008401385, a Model Demonstration Grant funded by the U.S. Office of Education, Division of Special Education and Rehabilitation, Handicapped Children's Early Education Program.

Orientation and Mobility for Deaf-Blind Children: Implications For Teachers, Paraprofessionals, and Parents

Deaf-Blind children are diverse in terms of their personalities, intelligence, and presence of other handicaps. The great majority of deaf-blind children have some residual vision and hearing. However, they vary in the amounts of residual vision and hearing they have as well as how they use their remaining vision and hearing. Many congenitally deaf-blind children experience developmental delays in several areas, including orientation and mobility (O&M).

Orientation is the process of utilizing sensory information to establish one's position in the environment. Mobility is the process of moving safely, efficiently, and gracefully within one's environment. The ultimate goal of orientation and mobility instruction is for visually handicapped persons to be able to travel in any environment as independently as possible (Hill & Ponder, 1976).

Since two major sensory systems are affected in deaf-blind children and because they are heterogeneous in terms of their behavioral characteristics, an expansion of the traditional definition of O&M is warranted. An expanded definition of O&M for diverse preschool visually handicapped populations was offered by Hill, Rosen, Correa, and Langley (1984). They suggested that O&M need to be broadly conceptualized and include the areas of (a) sensory skill development, (b) concept development, (c) motor development, (d) environmental and community awareness, (e) formal orientation skills and (f) formal mobility skills. A brief description of each of these areas follows.

Sensory Skill Development

Stimulating any useful vision or hearing of deaf-blind children can greatly facilitate purposeful movement. Children who have some residual vision should be encouraged to develop scanning, tracking, fixation and visual perception skills. By teaching children how to use their vision more efficiently (i.e., teaching what, where, how, and when to look for things in their environment) and to use low vision aids when appropriate may greatly enhance purposeful mobility (Barraga, 1983). Likewise, for those children who have some residual hearing, skills such as sound localization, identification, discrimination, and echolocation should be stressed.

All the senses play an important role in identifying, interpreting, and utilizing environmental information for purposeful movement. The tactile system is an extremely important sense for deaf-blind children. Many deaf-blind children are tactually defensive, so early tactile stimulation should be encouraged. Distinguishing and identifying different textures and

temperatures with different body parts, (i.e., hands, feet, etc.) are important prerequisite skills for deaf-blind children to develop before more advanced O&M skills, such as the cane, can be taught.

Concept Development

Most deaf-blind preschool children need formal instruction in concept development before they are able to master advanced travel skills and techniques. Body image concepts (knowledge, relationships, functions, and movement of body parts); spatial concepts (concepts of position, shape, size, and measurement); and environmental concepts (i.e., corner, street, block, etc.) are all important prerequisite concepts which enhance safe, efficient, and independent orientation and mobility. Basic spatial and environmental concepts are developed by deaf-blind children interacting with their environment. Knowledge of basic concepts facilitates the understanding of spatial relationships as well as one's movement in space.

Motor Development

Deaf-blind children characteristically demonstrate difficulty in motor skill development. They tend to progress more slowly, require explicit modeling, move more slowly during actual movement, and require more practice than sighted children to achieve skills. Problems of motor development most often noted include the areas of posture, gait, midline development, trunk and extremity strength, flexibility, motor planning, body rotation, and coordinated movement of the trunk and extremities out of primitive reflexive movement patterns.

Environmental And Community Awareness

Environmental and community awareness is fundamental to the development of later O&M skills as well as basic to the development of sensory awareness and functioning, motor skills, and spatial, temporal, distance, and other concepts. Environmental and community awareness are examples of incidental learning experiences that sighted children enjoy as they travel with parents and teachers on errands, field trips, and daily activities. Deaf-blind children often miss out on opportunities for such incidental learning, only because they cannot casually observe or hear those around them functioning within the environment and community. For this reason, they may be delayed in comparison to sighted peers in development of concepts, social skills, and skills of independence. For deaf-blind children, directed instruction and systematic exposure to the world around them is crucial.

Formal Orientation Skills

The development of orientation skills is dependent upon maximum development and use of the senses. Formal orientation instruction

includes such skills as (a) identifying and using landmarks and clues, (b) the ability to align the body to objects for the purpose of establishing and maintaining a straight line of travel, and (c) the use of systematic search patterns to explore novel objects or environments. Orientation skills provide ways to make movement more efficient.

Formal Mobility Skills

Formal mobility skills have been designed to provide visually handicapped persons with a safe method for negotiating their environment. Some examples of formal mobility skills are (a) sighted guide skills, (b) protective techniques and (c) cane skills. (For a complete list and description, see Hill & Ponder, 1976.)

The majority of formal mobility skills are designed for ambulatory persons. Therefore, the development of gross motor skills, including posture and gait, with deaf-blind children is essential prior to the introduction of formal mobility skills.

The Relationship And Interrelationship of O&M To Major Developmental Areas

The provision of O&M services to very young visually handicapped/multi-handicapped children is new. Orientation and mobility specialists have and for the most part continue to serve children through a therapy approach. Orientation and mobility is a necessary and important component of any curriculum for deaf-blind children and should not be taught in isolation of other curricular areas. A brief example depicting the relationship and interrelationship of O&M to major curriculum areas follows. (For a more detailed treatment of this concept, see Hill et al., 1984)

A trip to the grocery store offers many integrative curricular experiences with O&M. Perceptual, language, motor, and cognitive development can be facilitated by tactile discrimination and identification activities. For example, allowing the child to explore items of different sizes, shapes, weight, texture, and temperature provides information based upon concrete experiences in order to develop concepts which ultimately enhance language. The grocery store environment also offers deaf-blind children many opportunities to ultilize their other senses (vision, hearing, olfactory). The notions of self-help skills and social skills can also be introduced during the grocery store lesson. The basic idea of a shopping trip to purchase food which will ultimately be consumed can be introduced. Experiences like the grocery store lesson provide a conceptual foundation for deaf-blind children so they have some perspective that food does not "magically" appear on their place at mealtime. The grocery store environment also provides ample opportunities for social skill development.

Although very young deaf-blind children may need a great deal of assistance with many of the activities described in the grocery

store lesson, it is important that integrative lessons start as early as possible. Early integrative O&M lessons, whether they are done in the classroom, home, or community, will ultimately facilitate the learning of more advanced travel skills when the child is older.

Implications For Teachers

For a variety of reasons, O&M specialists do not frequently directly serve deaf-blind children on their caseloads. However, there are many things that teachers, paraprofessionals, and parents can do to enhance O&M of young deaf-blind children. The following suggestions are offered to facilitate the development of O&M skills.

1. Encourage movement and exploration throughout the day. Combine and integrate movement with other activities in which the child is engaged.

2. Structure the environment in such a way to encourage movement; for example, placing favorite toys on the high chair tray, in the crib, etc.

3. Select toys and objects which will stimulate sensory development; for example, objects that are brightly colored, make sounds, offer different textures, etc.

4. Be a good observer. Does the child startle when there is a loud noise? Does the child attend to light? Does the child move around obstacles? Especially encourage the use of functional vision and hearing in movement activities.

5. Use real objects and natural environments to teach concepts rather than replicas or simulation activities. Attempt to use a multi-sensory approach when teaching object and environmental concepts.

6. Verbalize with action. It is important for the child to link actions with words or symbols in order for meaningful concepts to evolve.

7. Encourage the child to explore and manipulate objects in order to develop fine motor skills. The development of fine motor skills will be important later on in learning how to use a cane.

8. Keep the environment consistent to encourage safe and efficient movement. However, as the child becomes more secure in moving, systematically vary the environment to encourage exploration.

9. Teach the child how to systematically explore objects and new environments. Many deaf-blind children will not be naturally curious about their environment.

10. Use functional activities in facilitating O&M skills (i.e., using systematic search patterns to find a glass of milk on the table).

Summary

This paper has presented a broad conceptualization of O&M for young deaf-blind children. The ideas presented from an expanded definition of O&M and the infusion of O&M into all areas of a developmental curriculum are based on the notions of Hill, et al., (1984). Finally, practical guidelines to enhance the O&M skills of young deaf-blind children were presented for use by teachers, paraprofessionals and parents.

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References

Barraga, N. (1983). Visual handicaps and learning. Austin, TX: Exceptional Resources.

Hill, E. W., & Ponder, P. (1976). Orientation and mobility techniques: A guide for the practitioner. New York: American Foundation for the Blind.

Hill, E. W., Rosen, S., Correa, V. I., & Langley, M. B. (1984). Preschool orientation and mobility: An expanded definition. Education of the Visually Handicapped, 16(2), 58-72.

Suggested Readings

Davidson, I. F. W. K., & Simmons, J. N. (1984). Mediating the environment for young blind children: A conceptualization. Journal of Visual Impairment and Blindness, 78(6), 251-255.

Ferrell, K. A. (1979). Orientation & mobility for preschool children: What we have and what we need. Journal of Visual Impairment and Blindness, 73, 147-150.

Garry, R. J., & Ascarelli, A. (1960). Teaching topographical orientation and spatial orientation to congenitally blind children. Journal of Education, 143(2), 1-48.

Geruschat, D. R. (1980). Orientation and mobility for the low functioning deaf-blind child. Journal of Visual Impairment and Blindness, 74(1), 29-33.

Hapeman, L. B. (1967). Developmental concepts of blind children between the ages of three and six as they relate to orientation and mobility. International Journal for the Education of the Blind, 17(2), 41-48.

Harley, R. K., & Merbler, J. B. (1980). Development of an orientation and mobility program for multiply impaired low vision children. Journal of Visual Impairment and Blindness, 74(1), 9-13.

Hill, E. W. (1984). The role of the orientation and mobility instructor in public schools. In G. T. School (Ed.), Quality services for blind and visually handicapped learners: Statements of position. (pp.52-53). Reston, VA: ERIC Clearinghouse on Handicapped and Gifted Children.

Hill, E. W., & Ponder, P. (1976). Orientation and mobility techniques: A guide for the practitioner. New York: American Foundation for the Blind.

Hill, E. W., Rosen, S., Correa, V. I., & Langley, M. B. (1984). Preschool orientation and mobility: An expanded definition. Education of the Visually Handicapped, 16(2), 58-72.

Lydon, W. T., & McGraw, M. L. (1973). Concept development for visually handicapped children. New York: American Foundation for the Blind.

Mills, R. J. (1970). Orientation and mobility for teachers. Education of the Visually Handicapped, 2(3), 80-82.

Mills, R. J. (1971). Orientation and mobility for teachers. Education of the Visually Handicapped, 3(2), 58-59.

Mori, A. A., & Olive, J. E. (1978). The blind and visually handicapped mentally retarede: Suggestions for intervention in infancy. Journal of Visual Impairment and Blindness, 77(2), 67-70.

Olson, M. R. (1981). From the field: Enhancing the exploratory behavior of visually impaired preschoolers. Journal of Visual Impairment and Blindness, 75(9), 375-377.

Raynor, S., & Drouillard, R. (1975). Get a wiggle on: A guide for helping visually impaired children grow. Mason, MI: Ingham Intermediate School District.

Wardell, K. T. (1972). Preparatory concepts of orientation and mobility training. Education of the Visually Handicapped, 4(3), 86-87.

Warren, D. H. (1984). Blindness and early childhood development (Rev. ed.). New York: American Foundation for the Blind.

Webster, R. (1976). A concept development program for future mobility training. The New Outlook for the Blind, 70(5), 195-197.

Webster, R. (1979). Orientation and mobility training for the deaf-blind. Jacksonville, IL: Katan Publications.

APPENDIX A

CURRICULA THAT INCLUDE THE 0-24 MONTH DEVELOPMENTAL PERIOD

CURRICULA THAT INCLUDE THE 0-24 MONTH DEVELOPMENTAL PERIOD

A PRE-LANGUAGE CURRICULUM GUIDE FOR THE MULTIHANDICAPPED
Author: Curtis, et al.
Publisher: Outreach Precollege
Address: Room 3400, KDES Gallaudet College
State-Zip: Washington, D.C. 20002
Phone: 202-651-5048
Cost: $11.75 plus $2.50 shipping
Developmental Ages: 0-60 months
Assessment/Profile: no
Adaptations Included: no
Brief Description: Based on Van Dijk theory of coactive movement, this language curriculum has been developed for the student who is deaf-blind and/or severely handicapped.

ACTIVE STIMULATION CURRICULUM AND MANUAL
Author: Zuromski, Edmond S.
Publisher: Handicapped Childrens Technological Services, Inc.
Address: PO Box 7, Foster
State-Zip: RI 02825
Phone: 401-861-6128
Cost: n/a
Developmental Ages: developmentally sequenced
Assessment/Profile: no
Adaptations Included: yes, motor impaired
Brief Description: Developmental activities in the areas of motor, sensory, language, and cognition are integrated with adaptive switches. Guidelines for the selection of appropriate adaptive devices are included.

AUSTIN WORK SKILLS CURRICULUM
Author: Stone, Gretchen and Wade, Annie Beth
Publisher: Texas School for the Blind
Address: 3710 Cedar Street
State-Zip: Austin, TX 78705
Phone:
Cost: (write to publisher)
Developmental Ages: 0-24 months
Assessment/Profile: yes
Adaptations Included:no
Brief Description: Based on Piagetian theory of sensorimotor development, this curriculum is designed to develop functional behaviors that are basic to productive activity.

CAROLINA CURRICULUM FOR HANDICAPPED INFANTS (1985)
Author: Nancy M Johnson, Ken G Jens, and Susan M Attermeier
Publisher: Brookes Publishing Company
Address: PO Box 10624, Baltimore
State-Zip: MD, 21285-0883
Phone: 301-377-0883
Cost: $29.95
Developmental Ages: 0 - 24 months
Assessment/Profile: yes, assessment log at $15.95 per 10
Adaptations Included: yes, visual and motor impaired
Brief Description: This developmentally sequenced curriculum consists of 24 domains (e.g., tactile integration, auditory and space localization, gestural communication) The nine cognition domains are based on Piagetian theory.

COMMUNICATION CURRICULUM (1984)
Author: Stremel-Campbell, Kathleen, Johnson-Dorn, Guida, and Udell
Publisher: Teaching Research
Address: Monmouth
State-Zip: Oregon 97361
Phone: (503)838-1220
Cost: $20.00
Developmental Ages: 0-18 months
Assessment/Profile: yes, sold separately
Adaptations Included:
Brief Description: Based on early cognitive, social, and communicative skills, this communication curriculum consists of 140 task analyzed skills. Programming for generalization and data collection procedures are included.

CURRICULUM GUIDE FOR DEAF-BLIND STUDENTS
Author: LeVan, Sally and Hanley, Beth
Publisher: Stoelting Company
Address: 1350 South Kostner Avenue
State-Zip: Chicago, IL
Phone: (312) 522-4500
Cost: $65.00 (volumes can be purchased separately)
Developmental Ages: 0 - 60 months
Assessment/Profile: yes
Adaptations Included: yes, deaf-blind and motor impaired
Brief Description: This four volume curriculum consists of activities in the areas of Communication, Techniques of Daily Living, Orientation & Mobility, and Sensory Stimulation for students who are deaf-blind.

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CURRICULUM GUIDE: HEARING-IMPAIRED CHILDREN BIRTH TO THREE YEARS AND THEIR PARENTS (1977)
Author: Northcott, Winifred H.
Publisher: Alexander Graham Bell Association for the Deaf
Address: 3417 Volta Place, NW
State-Zip: Washington, DC 20007
Phone: 202-337-5220
Cost: $14.95 (Plus $2.00 postage)
Developmental Ages: 0 - 36 months
Assessment/Profile: yes
Adaptations Included: no
Brief Description: Presents guidelines for the development of a family-oriented preschool program for hearing impaired preschool children.This auditory-oral approach includes stimulation activities and a videotape rating scale.

DEVELOPMENTAL PROGRAMMING FOR INFANTS AND YOUNG CHILDREN (1981)
Author: Schafer, D. S., Ed. and Moersch, M. S., Ed.
Publisher: University of Michigan Press
Address: Deaprtment YB, PO Box 1104, Ann Arbor
State-Zip: MI 48106
Phone: 313-764-4394
Cost: $16.00 (Volumes 1-3: Assessment/Application,Profile,Activities)
Developmental Ages: 0 - 36 months
Assessment/Profile: yes, must be ordered separately
Adaptations Included: yes, motor,visual, and hearing impaired
Brief Description: This developmentally sequenced curriculum identifies the behavior, the skill, and activity description. Cognition items are cross-referenced with Piagetian domains of sensorimotor intelligence.

HAWAII EARLY LEARNING PROFILE (HELP) AND HELP ACTIVITY GUIDE (1979)
Author: Furuno, et.al.
Publisher: Vort Corporation
Address: P.O. Box 60132, Palo Alto
State-Zip: CA 94306
Phone: 415-965-4000
Cost: $14.95 (For Activity Guide)
Developmental Ages: 0 - 36 months
Assessment/Profile: yes (HELP charts @ $2.95 per set of three)
Adaptations Included: yes, motor impaired
Brief Description: This developmentally sequenced curriculum suggests several activities per each target behavior in all areas of child development. Suggestions for "older-delayed" students are included.

HELPING YOUR EXCEPTIONAL BABY: A PRACTICAL AND HONEST APPROACH TO RAISING A MENTALLY RETARDED CHILD (1980)
Author: Cunningham, C. and Sloper, P.
Publisher: Pantheon Books
Address: 201 E. 50th St., New York
State-Zip: NY 10022
Phone:
Cost: $12.95
Developmental Ages: 0 - 24 months
Assessment/Profile: yes
Adaptations Included:
Brief Description: A guide for parents that deals with parenting a handicapped infant. Includes developmental checklist and curriculum.

HICOMP CURRICULUM AND GUIDE (1983)
Author: Willoughby-Herb, Sara J. and Neisworth, John T.
Publisher: Charles E. Merrill (reference #410770)
Address: Columbus
State-Zip: OH 43216
Phone: (800) 848-1567
Cost:$60.00
Developmental Ages: 0 - 60 months
Assessment/Profile: yes and a "track record" for recording progress
Adaptations Included: no
Brief Description: Based on normal developmental theory, this curriculum has been developed for typical and atypical children. Domains include motor, self-care, problem-solving, communication. Module on teaching strategies included.

INFANT LEARNING: A COGNITIVE-LINGUISTIC INTERVENTION STRATEGY
Author: Dunst, Carl J. (1981)
Publisher: DLM Teaching Resources
Address: PO Box 4000, Allen
State-Zip: TX 75002
Phone: 800-527-4747
Cost: $22.00
Developmental Ages: 0 - 24 months
Assessment/Profile: yes
Adaptations Included: no
Brief Description: An "ecological" approach to infant intervention that expands Piagetian theory of sensorimotor development. Emphasizes the acquisition of cognitive-linguistic competencies.

INFANT STIMULATION CURRICULUM (1978)
Author: [illegible], Coach, Storm, and Goodough
Publisher: The Nisonger Center Publications Dept
Address: 1580 Cannon Dr., Columbus
State-Zip: OH 43210
Phone: [illegible]
Cost: $10.00 (plus $1.00 shipping)
Developmental Ages: 0 - 36 months
Assessment/Profile: yes, developmental profile
Adaptations Included: no
Brief Description: This developmentally sequenced curriculum consists of a file of behaviors and suggested activities that are arranged on cards. Activities are divided into sections, such as coordination, locomotion, etc.

INFANT/TODDLER: INTRODUCING YOUR CHILD TO THE JOY OF LEARNING
Author: Badger, Earladeen
Publisher: [illegible] Educational Materials
Address: [illegible] Chicago Ave. S., Minneapolis
State-Zip: MN [illegible]
Phone: [illegible]
Cost: [illegible] (can be purchased through local school supply stores)
Developmental Ages: 0 - 36 months
Assessment/Profile: yes, developmental profile
Adaptations Included: no
Brief Description: A resource written for parents/caregivers, this book suggests learning activities that follow developmental sequence. Progress indicators and toy suggestions are included.

INSITE CURRICULUM MANUALS
Author: SKI*HI Institute
Publisher: Department of Communicative Disorders
Address: UMC 10, Utah State University, Logan
State-Zip: Utah, 84322
Phone: [illegible]
Cost: [illegible] per set
Developmental Ages: infant
Assessment/Profile: yes, Insite checklist
Adaptations Included: yes; visual, hearing, and motor impaired
Brief Description: A four volume set designed for home intervention with sensory impaired children. How to conduct home visits, relating to parents, and activities for all developmental areas are included.

KOONTZ CHILD DEVELOPMENTAL PROGRAM: TRAINING ACTIVITIES FOR THE FIRST 48 MONTHS (1974)
Author: Koontz, Charles
Publisher: Western Psychological Services
Address: Order Dept 12031 Wilshire Blvd, Los Angeles
State-Zip: CA 90025
Phone: 213-478-2061
Cost: $25.90 (Plus 10% postage)
Developmental Ages: 0 - 48 months
Assessment/Profile: yes
Adaptations Included: no
Brief Description: This program suggests evaluation and remedial activities in gross/fine motor, social, and language areas of child development.

LEARNING THROUGH PLAY
Author: Fewell, R. and Vadasy, P.
Publisher: DLM Teaching Resources
Address: PO Box 4000, Allen
State-Zip: TX 75002
Phone: 800-527-4747
Cost: $19.00
Developmental Ages: 0 - 36 months
Assessment/Profile: no
Adaptations Included: yes
Brief Description: A survey of current knowlege about natural learning and the maturation process with activities for infants and toddlers.

MACOMB 0-3 REGIONAL PROJECT CORE CURRICULUM
Author: Hutinger, Patti and staff (1980)
Publisher: Macomb 0-3 Regional Project
Address: 27 Horrabin Hall, Macomb
State-Zip: IL 61455
Phone: 309-298-1634
Cost: $49.95;CORK(Computer Record Keeper for curriculum available)
Developmental Ages: 0 - 36 months
Assessment/Profile: yes, developmental profile
Adaptations Included: yes, visual, motor, hearing impaired
Brief Description: This developmentally sequenced curriculum includes three sections: 1)Introduction; 2)Curriculum; 3)Program Planning Guide. Curricular areas are divided into clusters of behaviors that are related.

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OREGON PROJECT FOR VISUALLY IMPAIRED AND BLIND PRESCHOOL CHILDREN
Author: OREGON Project (1978)
Publisher: Jackson Education Service District
Address: 101 N Grape, Medford
State-Zip: OR 97501
Phone: 503-776-8552
Cost: $60.00
Developmental Ages: 0 - 72 months
Assessment/Profile: yes
Adaptations Included: yes, visually impaired
Brief Description: Designed for children who are visually impaired or blind, this curriculum consists of a manual, skills inventory, and teaching activities. Includes prerequisites for orientation and mobility and braille.

PARENT-INFANT COMMUNICATION: A PROGRAM OF CLINICAL AND HOME TRAINING FOR PARENTS AND HEARING IMPAIRED INFANTS
Author: Sitnick, Rushmer, Arpan (1977)
Publisher: Infant Hearing Resource, Good Samaratin Hospital
Address: 1015 N.W. 22nd Ave., Portland
State-Zip: Oregon 97210
Phone: 503-229-7526
Cost: $34.95 (Plus $2.50 postage)
Developmental Ages: 0-48 months
Assessment/Profile:
Adaptations Included: yes, hearing impaired
Brief Description: Emphasizing communication skills and parent involvement,this curriculum uses an auditory-oral or total communication approach. Parent objectives include behavior management, observation skills, and recordkeeping.

PORTAGE GUIDE TO EARLY EDUCATION
Author: Bluma et al (1976)
Publisher:The Portage Project Coop Educational Service Agency #12
Address: 412 East Slifer St, Box 564, Portage
State-Zip: WI 53901
Phone: 608-742-8811
Cost: $50.00
Developmental Ages: 0 - 72 months
Assessment/Profile: yes, behavior profile
Adaptations Included: yes
Brief Description: Each kit contains a developmentally sequenced behavioral checklist, a corresponding activity card file, and a manual which describes how to implement the program. Available in 23 languages.

ERIC

PROGRAM GUIDE FOR INFANTS AND TODDLERS WITH NEUROMOTOR AND OTHER DEVELOPMENTAL DISABILITIES
Author: Conner, Williamson, and Siepp (1978)
Publisher: Teachers College Press
Address: PO Box 1540, Hagerstown
State-Zip: MD 21741
Phone: 800-638-3030
Cost: $15.95
Developmental Ages: 0 - 36 months
Assessment/Profile: yes, developmental profile
Adaptations Included: yes
Brief Description: This program includes intervention strategies as well as information on health issues relevant to the target population.

PROJECT KIDS CURRICULUM PACKAGE
Author: Project KIDS Staff
Publisher: Project KIDS
Address: 3801 Herschel St, Dallas
State-Zip: TX 75219
Phone: 214-526-0990
Cost: $10.25
Developmental Ages: 0 - 60 months
Assessment/Profile: yes, Appraisal Package sold separately @ $3.95
Adaptations Included:
Brief Description: This curriculum corresponds with the KIDS Inventory of Development. Learning activities are suggested for each behavior. Assessment items are also cross-referenced with learning activities in commercially available kits. Staff Development and Family Involvement Packages are also available.

PROJECT MEMPHIS: ENHANCING DEVELOPMENTAL PROGRESS IN PRESCHOOL EXCEPTIONAL CHILDREN (1974)
Author: Quick, Little, and Campbell
Publisher: David S. Lake Publishers
Address: 19 Davis Dr., Belmont
State-Zip: CA 94002
Phone: 415-592-7810
Cost: $7.50 (prepaid)
Developmental Ages: 0 - 60 months
Assessment/Profile: yes,(Memphis Comprehensive Developmental Scale)
Adaptations Included: no
Brief Description: A program designed for developmentally delayed children functioning from the birth to five year level.

SKI*HI CURRICULUM MANUAL: PROGRAMMING FOR HEARING IMPAIRED INFANTS THROUGH HOME INTERVENTION (1985)
Author: Clark, T. and Watkins, S.
Publisher: Project SKI*HI; Dept of Communicative Disorders UMC 10
Address: Utah State University, Logan
State-Zip: Utah 84322
Phone: 801-752-4601
Cost: $35.00
Developmental Ages: 0-36 months
Assessment/Profile: yes, booklet sold separately for $2.00
Adaptations Included: yes, hearing impaired
Brief Description: A home intervention model developed for hearing impaired children and their families with emphasis on the development of communication skills and on providing emotional support and technical assisstance.

SKI*HI HOME INTERVENTION PROGRAM ADAPTATION
Author: Clark, T. and Watkins, S.
Publisher: SKI*HI Institute, Utah State University
Address: Dept. of Communicative Disorders, Logan
State-Zip: UT 84322
Phone: 801-752-4601
Cost: $25.00
Developmental Ages: 0-36 months
Assessment/Profile: yes
Adaptations Included: yes, hearing impaired
Brief Description: An adaptation of the SKI*HI Model for use with parents who prefer a simplified version of the program. Simplified lessons and overlay illustrations are included.

SMALL WONDER (Level 1 and Level 2)
Author: Karnes, Merle B. (1979)
Publisher: American Guidance Service
Address: Publishers Building, Circle Pines
State-Zip: MN 55014
Phone: 800-328-2560
Cost: $92.50 per Level
Developmental Ages: 0-36 months
Assessment/Profile: no
Adaptations Included: yes, motor impaired and developmentally delayed
Brief Description: This language stimulation curriculum consists of 150 activity cards per each level. A user's guide is included for each level that discusses topics such as development, health and safety, and adapting for physically handicapped children.

STEP-BY-STEP LEARNING GUIDE FOR RETARDED INFANTS AND CHILDREN
Author: Johnson, Vicki and Werner, Roberta (1975)
Publisher: Syracuse University Press
Address: 1600 Jamesville Av, Syracuse
State-Zip: NY 13210
Phone: 315-423-2596
Cost: $9.95 (Plus $1.50 postage)
Developmental Ages: 0 - 48 months
Assessment/Profile: no
Adaptations Included: no
Brief Description: This guide contains 240 task-analyzed skills with descriptions of teaching procedures.

TEACHING RESEARCH CURRICULUM FOR MODERATELY AND SEVERELY HANDICAPPED
Author: Fredericks et al. (1980)
Publisher: Charles C.Thomas Publisher
Address: 2600 S First St., Springfield
State-Zip: IL 62717
Phone: 217-789-8980
Cost: Self-Help/Cognitive and Gross/Fine Motor @ $17.75 each
Developmental Ages: 0 - 60 months
Assessment/Profile: yes
Adaptations Included: yes, deaf-blind
Brief Description: Task analyzed activities are developmentally sequenced to promote training and generalization. Adaptations for students who are deaf-blind are included.

TEACHING YOUR DOWN'S SYNDROME CHILD: A GUIDE FOR PARENTS
Author: Hanson, Marci J. (1978)
Publisher: Pro-Ed
Address: 5341 Industrial Oaks Blvd., Austin
State-Zip: TX 78735
Phone: 512-892-3142
Cost: $17.00 (prepaid)
Developmental Ages: 0 - 24 months
Assessment/Profile: yes, developmental profile
Adaptations Included: no
Brief Description: Written for parents and professionals, this developmentally sequenced curriculum describes teaching activities for motor (gross & fine), communication, social, and self-help skills. Topics such as setting goals, collecting data, and evaluating progress are included.

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TIME TO BEGIN
Author: Kmitriev, V. (1982)
Publisher: Caring
Address: PO Box 400, Milton
State-Zip: WA 98354
Phone:
Cost: Hardcover $30.00 Softcover $20.00
Developmental Ages: 0 - 24 months
Assessment/Profile:
Adaptations Included:
Brief Description: A manual for guiding the development of children with Down Syndrome from infancy to two years.

YOU AND YOUR SMALL WONDER (BOOK 1 AND BOOK 2)
Author: Karnes, Merle B.
Publisher: American Guidance Service
Address: Publishers Building, Circle Pines
State-Zip: MN 55014
Phone: 800-328-2560
Cost: 8.50 per Book
Developmental Ages: 0 - 36 months
Assessment/Profile: yes, developmental profile
Adaptations Included:no
Brief Description: A combined total of over 300 parent-tested learning activities covering all areas of child development are included in this two volume set. Book 1 is for infants 0 - 18 months and Book 2 for 18 - 36 months age.

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APPENDIX B

EXAMPLES OF MATERIALS BY SENSORY FEATURES

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EXAMPLES OF MATERIALS BY SENSORY FEATURES

A. VISUAL-BRIGHTLY COLORED

Automatic Choral Top
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $10.00
Brief Description: Spinning top produces different pitched sounds while spinning. Has suction base.

Bath Bubbles
Purchase Source: K-Mart
Address:
City/State:
Cost: $4.00 for 2
Brief Description: See through plastic ball with a figure inside. Ball will float for water play. Orange ball is fluorescent.

Braille Colored Pencils
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost:$8.00 (set of 12)
Brief Description: Colors are abbreviated on a braille flag on each pencil. Braille color chart is included.

Brailled Colored Markers
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost:$18.00 (set of 24)
Brief Description: Set of 24 colors has brailled flags and a brailled chart.

Brailled Temperas
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost:$8.00
Brief Description: Set of 6 colors with brailled labels and braille chart.

VISUAL-BRIGHTLY COLORED

Bright Sights: Learning to See
Purchase Source: American Printing House for the Blind
Address: PO Box 6085
City/State: Louisville, KY 40206-0085
Cost:$368.75
Brief Description: Sensory and perceptual materials to stimulate visual attention in young visually handicapped children.

Bristle Blocks
Purchase Source: Contructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost:$19.50 (57 piece set)
Brief Description: Soft bristled blocks interlock.

Butterfly Rattle
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Suction cup base with clear plastic globe contains reflective butterfly and colored beads.

Butterfly YOYO
Purchase Source: Toy/variety store
Address:
City/State:
Cost:
Brief Description: Hard plastic yoyo.

Corn Popper (Fisher Price)
Purchase Source: Sears
Address:
City/State:
Cost: $6.88
Brief Description: Push toy that makes a pop sound when pushed as bright colored balls dance inside clear plastic dome.

VISUAL-BRIGHTLY COLORED

Cowboys & Indians
Purchase Source: Toy or variety/discount store
Address:
City/State:
Cost: $1.67
Brief Description: Twenty-five bright colored, hard plastic figures.

Donald Duck Push-Up Puppet
Purchase Source: Toy/variety store
Address:
City/State:
Cost:
Brief Description: Plastic puppet moves when bottom of base is pressed.

First Rhythm Band Center
Purchase Source: Contructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost:$16.95
Brief Description: Twelve inch base holds drum, 2 bells, 4 note xylophone, and mallet.

Florist foil
Purchase Source: florist shop
Address:
City/State:
Cost:
Brief Description: Reflective foil available in a variety of colors.

Fluorescent Paint Set
Purchase Source:
Address:
City/State:
Cost:
Brief Description: Six plastic jars of fluorescent paint in basic colors.

VISUAL-BRIGHTLY COLORED

Frisbee
Purchase Source: Toy or variety store
Address:
City/State:
Cost:
Brief Description: Disc shaped toy for throwing and catching. Can be purchased in bright colors.

Glow in the dark frisbee
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Fluorescent colored frisbee.

Hammer the Beads
Purchase Source: Lexington Toy Shop
Address:
City/State:
Cost: $22.95
Brief Description: Hammer brightly colored beads through holes on board.

Happy Apple
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $8.75
Brief Description: Makes chime-like sound and vibratory sensation when shaken. Floats in water.

Happy Loco
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost:
Brief Description: Train engine, loud bell and siren sound as it is pushed along.

VISUAL-BRIGHTLY COLORED

Hedgehogs
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $6.50 (set of 3)
Brief Description: Apple size, brightly colored soft vinyl hedgehogs squeak when squeezed.

Jack in the Ball
Purchase Source: Toy store
Address:
City/State:
Cost: $10.95
Brief Description: Squeaks and head pops up when button is pushed.

Keys Play
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $18.95
Brief Description: Five differently shaped keys produce movement and sound when turned in their corresponding shapes on play center.

Lite Brite (Hasbro)
Purchase Source: DLM Teaching Resources
Address: PO Box 4000 One DLM Park
City/State: Allen, TX 75002
Cost: $24.95
Brief Description: Colored pegs light up when inserted into peg board. Set includes 369 pegs, 15 designs to copy, and 9 blank sheets.

Melody Mike
Purchase Source: Toy store
Address:
City/State:
Cost: $14.00
Brief Description: Battery operated toy. Mouth opens and when teeth are pushed, musical tones and a vibratory sensation are produced.

VISUAL-BRIGHTLY COLORED

Melody Train
Purchase Source: Sears
Address:
City/State:
Cost: $10.00
Brief Description: Battery operated train moves around xylophone track. Arrangement of track determines tune.

Mylar Balloon
Purchase Source: Spencer's Gifts
Address:
City/State:
Cost: $3.00
Brief Description: Helium inflated balloon. Can be purchased in bright colors and/or reflective materials.

Play Gym
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $12.65
Brief Description: Figures spin, rattle and squeek on center bar. Has strap for attachment to crib.

Playring
Purchase Source: The Able Child
Address: 325 W 11th St
City/State: New York NY 10014
Cost: $8.50
Brief Description: Rubber ring with wooden beads. Each bead looks, feels and tastes differently.

Plush Animal Puppets
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $4.25 each
Brief Description: Plush, brightly colored flannel hand puppets with large movable mouths.

ERIC

[illegible]

Poster Colors
Purchase Source: Gold Circle
Address:
City/State:
Cost: $1.49
Brief Description: Six plastic jars of tempera paint.

Round-a-Round
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $10.95
Brief Description: All enclosed. One push makes striped pole spin and colorful balls dance.

Bubble Ball
Purchase Source: Fisher Price
Address:
City/State:
Cost:
Brief Description: Colorful balls in clear plastic ball roll and bounce when handle is pushed or pulled along.

Rock 'N Roll
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Plastic sphere rocks, rolls and rattles. Another ball whirls inside but won't fall out. Floats in water.

Rock-a-Stack
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $3.89
Brief Description: Five plastic rings fit over cone in a sequence of spectrum and size. On rocking base.

VISUAL-BRIGHTLY COLORED

Rubber Puzzle
Purchase Source: Children Love Us Inc
Address:
City/State: Brooklyn NY 11220
Cost:
Brief Description: Rubber shapes puzzle. (Contains small parts so not recommended for children under 3 years).

Sensory Stimulation Kit (cat # 1-0861)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $419.90
Brief Description: Kit facilitates the development of basic sensory processes. Materials available separately.

Shapes and Sound Sensations
Purchase Source: Childcraft
Address: 20 Kilmer Rd
City/State: Edison NJ 08818
Cost: $8.95
Brief Description: A set of four, brightly colored shapes. Each shape makes a different sound when moved or touched.

Shoe Spots
Purchase Source: Sporting goods store
Address:
City/State:
Cost: $1.99/pr
Brief Description: Self stick, brightly colored plastic strips.

Soft Textured Blocks
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $13.90
Brief Description: Large, soft vinyl blocks with different raised designs and numbers. Squeak when squeezed.

VISUAL-BRIGHTLY COLORED

Spin-A-Sound
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $12.25
Brief Description: Paddles, dial, and crank make different sounds when manipulated.

Surveyor's tape
Purchase Source: office supply store or variety/discount store
Address:
City/State:
Cost:
Brief Description: Fluorescent colored tape.

Table Tennis Balls
Purchase Source: K-Mart
Address:
City/State:
Cost:
Brief Description: Brightly colored table tennis balls.

Teddy Bear Rattle
Purchase Source: Discovery Toys
Address: 400 Ellinwood Way
City/State: Pleasant Hills CA 94523
Cost: $4.98
Brief Description: Bear rattle has three balls in see-through circle on reflective background.

Tick-Tock Clock
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Large knobs move clock's hands and ring bell.

VISUAL-BRIGHTLY COLORED

Tracking Tube
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Red ball floats in clear, fluid-filled tube. Has bell and squeaker at opposite ends.

Turbo Tops
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Contains four tops and straws for propelling. Also contains a clear domed base which accommodates tops as they spin.

Turn & Learn Activity Center
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64040
Cost: $12.65
Brief Description: Eight separate action blocks; Crank & Click; color roller, mirror, kaleidoscope, turning pictures, dial, squeaker.

Visual Stimulation Kit (cat# 1-0862)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $89.00
Brief Description: Various materials to facilitate stimulation of the visual sense.

Water Mates
Purchase Source: Toy store
Address:
City/State:
Cost: $5.00
Brief Description: Duck floats in water inside clear plastic ball.

ERIC

VISUAL-BRIGHTLY COLORED

Wobble Globe
Purchase Source: Toy store
Address:
City/State:
Cost: $7.95
Brief Description: Brightly colored, bouncy ball rattle with suction base.

Xylophone
Purchase Source: Toy store
Address:
City/State:
Cost: $9.00
Brief Description: Pull-string xylophone.

A. VISUAL-FLUORESCENT

Bath Bubbles
Purchase Source: K-Mart
Address:
City/State:
Cost: $4.00 for 2
Brief Description: See through plastic ball with a figure inside. Ball will float for water play. Orange ball is fluorescent.

Blacklight
Purchase Source: Spencer's Gift Shop
Address:
City/State:
Cost: $15.00/ea.
Brief Description: Small blacklight for use with fluorescent objects.

Bright Sights: Learning to See
Purchase Source: American Printing House for the Blind
Address: PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $368.75
Brief Description: Sensory and perceptual materials to stimulate and localize visual attention in young visually handicapped children.

Crayola Fluorescent Crayons
Purchase Source: Thornburys
Address:
City/State:
Cost: $1.49
Brief Description: Colors illuminate under blacklight.

Fluorescent Paint Set
Purchase Source: Art supply store
Address:
City/State:
Cost:
Brief Description: Six plastic jars of fluorescent paint in basic colors.

VISUAL-FLUORESCENT

Glo Worm
Purchase Source: Sears
Address:
City/State:
Cost: $14.95
Brief Description: Caterpillar glows under blacklight, face lights up when body is squeezed.

Glow in the Dark Frisbee
Purchase Source: Toy/Variety store
Address:
City/State:
Cost:
Brief Description: Fluorescent frisbee. Can be purchased in a variety of colors.

HI Marks 3-D Marker
Purchase Source: Kentucky Industries for the Blind
Address:
City/State: Louisville KY 40206
Cost:
Brief Description: Squeeze out contents of tube to create raised marks on paper, metal, or wood fabrics.

Slinky
Purchase Source: Toy/Variety store
Address:
City/State:
Cost:
Brief Description: Plastic spring-like toy. Available in bright and fluorescent colors.

Surveyor's Tape
Purchase Source: Office supply or variety/discount store
Address:
City/State:
Cost:
Brief Description: Fluorescent tape in a variety of bright colors.

A. VISUAL-LIGHTED

Glo Worm
Purchase Source: Sears
Address:
City/State:
Cost: $14.95
Brief Description: Caterpillar glows under blacklight. Face lights up when body is squeezed.

Lite Brite (Hasbro)
Purchase Source: DLM Teaching Resources
Address: PO Box 4000 One DLM Park
City/State: Allen, TX 75002
Cost: $24.95
Brief Description: Colored pegs light up when inserted into peg board. Set includes 369 pegs, 15 designs to copy, and 9 blank sheets.

Sensory Stimulation Kit (cat # 1-0861)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $419.90
Brief Description: Kit facilitates the development of basic sensory processes. Materials available separately for specific sensory modalities.

Truckers' Light, Flashlights, Penlights
Purchase Source: Hardware store, variety/discount store
Address:
City/State:
Cost: $4.00-$15.00
Brief Description: Trucker's light has setting for steady or blink.

Visual Stimulation Kit (cat# 1-0862)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $89.00
Brief Description: Various materials to facilitate stimulation of the visual sense.

ERIC

A. VISUAL-MOVING

Ambulance
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Ambulance makes loud siren sound while moving.

Automatic Choral Top
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost:
Brief Description: Spinning top produces different pitched sounds while spinning. Has suction base.

Butterfly YOYO
Purchase Source: Toy/variety store
Address:
City/State:
Cost:
Brief Description: Hard plastic yoyo. Available in bright colors.

Donald Duck Push-Up Puppet
Purchase Source: Toy/variety store
Address:
City/State:
Cost:
Brief Description: Plastic puppet moves when bottom of base is pressed.

Happy Loco
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost:
Brief Description: Train engine, loud bell and siren sound as it is pushed along.

VISUAL-MOVING

Melody Train
Purchase Source: Sears
Address:
City/State:
Cost: $10.00
Brief Description: Battery operated train moves around xylophone track. Track arrangement determines tune.

Musical Puzzle Box
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $10.95
Brief Description: Musical sounds are produced as animal shapes slowly slide down chute.

Pinwheels
Purchase Source: Toy/variety store
Address:
City/State:
Cost:
Brief Description: Pinwheel spins when blown or moved. Also available in metallic colors.

Pound-A-Round
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $10.95
Brief Description: All enclosed. One push makes striped pole spin and colorful balls dance.

Rattle Ball
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Colorful balls in clear plastic ball roll and bounce when handle is pushed or pulled along.

VISUAL-MOVING

Ring-A-Round Top (with adapted handle)
Purchase Source: The Able Child
Address: 325 West 11th St
City/State: New York NY 10014
Cost: $17.95
Brief Description: Big Bird and Cookie Monster spin and bell sounds when handle is pushed down.

Rock 'N Roll
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Plastic sphere rocks, rolls and rattles. Another ball whirls inside but won't fall out. Floats in water.

Slinky
Purchase Source: Toy or variety/discount store
Address:
City/State:
Cost:
Brief Description: Plastic spring-like toy. Available in bright and fluorescent colors.

Three Men In A Tub
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Plastic tub rings when rocked or spun. Figures are removable.

Tick-Tock Clock
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Large knobs move clock hands and ring bell.

VISUAL-MOVING

Tracking Tube
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Red ball floats in clear, fluid-filled tube; has bell and squeaker at opposite ends.

Turbo Tops
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Contains four tops and straws for propelling. Also contains a clear domed base which accommodates tops as they spin.

ERIC

A. <u>VISUAL-REFLECTIVE</u>

Baby Mirror
Purchase Source: Childcraft
Address: 20 Kilmer Rd Cn 066
City/State: Edison, NJ 08818
Cost: $8.50
Brief Description: Break resistent mirror in sturdy plastic.

Blacklight
Purchase Source: Spencer's Gift Shop
Address:
City/State:
Cost: $15.00/ea.
Brief Description: Small blacklight to use with fluorescent objects.

Bright Sights: Learning to See
Purchase Source: American Printing House for the Blind
Address: PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $368.75
Brief Description: Sensory and perceptual materials to stimulate and localize visual attention in young visually handicapped children.

Butterfly Rattle
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Suction cup base with clear plastic globe contains reflective butterfly and colored beads.

Follow-Me Mirror
Purchase Source: Childcraft
Address: 20 Kilmer Road
City/State: Edison, NJ 08818
Cost: $14.95
Brief Description: Unbreakable mirror that sits upright on wheels.

ERIC

VISUAL-REFLECTIVE

Mylar Balloon
Purchase Source: Spencer's Gifts
Address:
City/State:
Cost: $3.00
Brief Description: Helium inflated balloon. Can be purchased in bright colors and/or reflective materials.

Pinwheels
Purchase Source: Toy/variety store
Address:
City/State:
Cost:
Brief Description: Pinwheel spins when blown or moved. Also available in metallic colors.

Shapes and Sound Sensations
Purchase Source: Childcraft
Address: 20 Kilmer Rd
City/State: Edison NJ 08818
Cost: $8.95
Brief Description: A set of four, brightly colored shapes. Each shape makes a different sound when moved or touched.

Shoe Spots
Purchase Source: Sporting goods store
Address:
City/State:
Cost: $1.99/pr
Brief Description: Self stick, brightly colored plastic strips.

Teddy Bear Rattle
Purchase Source: Discovery Toys
Address: 400 Ellinwood Way
City/State: Pleasant Hills, CA 94523
Cost: $4.98
Brief Description: Bear rattle with three balls in a see-through circle on reflective background.

VISUAL-[illegible]

Turn & Learn Activity Center
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $[illegible]
Brief Description: Eight separate action blocks; Crank & Click, color roller, mirror, kaleidoscope, turning pictures, dial, squeaker.

Visual Stimulation Kit (cat# 1-0862)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $[illegible]
Brief Description: Various materials to facilitate stimulation of the visual sense.

Florist Foil
Purchase Source: Florist shop
Address:
City/State:
Cost:
Brief Description: Reflective foil available in a variety of colors.

Sensory Stimulation Kit (cat # 1-0861)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $419.90
Brief Description: Kit facilitates the development of basic sensory processes. Materials available separately.

B. AUDITORY

Ambulance
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Ambulance which makes a loud siren sound while moving.

Auditory Stimulation Kit (cat # 1-0864)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av Po Box 6085
City/State: Louisville, KY 40206-0085
Cost: $100.04
Brief Description: Various materials to stimulate auditory perception in young handicapped children.

Automatic Choral Top
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost:
Brief Description: Spinning top produces different pitched sounds while spinning. Has suction base.

Corn Popper (Fisher Price)
Purchase Source: Sears Catalog
Address:
City/State:
Cost: $6.88
Brief Description: Push toy that makes a pop sound when pushed as bright colored balls dance inside clear plastic dome.

Cradle Gems
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $18.95
Brief Description: Soft shapes each making a different sound when grasped. Can be used separately or suspended by the cord included in kit.

First Rhythm Band Center
Purchase Source: Contructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $16.95
Brief Description: Twelve inch base holds drum, 2 bells, 4 note xylophone, and mallet.

Firstplay Block Rattle
Purchase Source: Quester Education Products Co
Address:
City/State:
Cost:
Brief Description: Apple sized plastic rattle; contains woods beads for rattling and holes for finger play.

Fisher Form
Purchase Source: Toy store
Address:
City/State:
Cost: $19.95
Brief Description: Clear plastic sorter box of shapes filled with beads.

Frog Chorus
Purchase Source: Sears
Address:
City/State:
Cost: $9.99
Brief Description: Battery operated "piano", press keys and colorful frogs open their mouths and "sing". Keys emit vibratory sensations.

Hammer the Beads
Purchase Source: Lexington Toy Shop
Address:
City/State:
Cost: $22.95
Brief Description: Hammer beads through holes.

Happy Apple
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $8.75
Brief Description: Makes chime-like sound and vibratory sensation when shaken. Floats in water.

Happy Loco
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost:
Brief Description: Train engine, loud bell and siren sounds as it is pushed along.

Hedgehogs
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $6.50 (set of 3)
Brief Description: Apple size, soft vinyl hedgehogs squeak when squeezed.

Horner Soundmaker
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost:
Brief Description: Tambourine shaped w/handle; strike with knuckles to produce sound.

Jack in the Ball
Purchase Source: Toy store
Address:
City/State:
Cost: $10.95
Brief Description: Squeaks and head pops up when button is pushed.

Keys Play
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $18.95
Brief Description: Five differently shaped keys produce movement and sound when turned in their corresponding shapes on play center.

Lil Walkman
Purchase Source: Sears
Address:
City/State:
Cost: $12.00
Brief Description: Battery operated "cassette player" with five cassettes that play ten melodies.

Melody Mike
Purchase Source: Toy store
Address:
City/State:
Cost: $14.00
Brief Description: Battery operated toy. Mouth opens and when teeth are pushed musical tones and a vibratory sensation occur.

Melody Train
Purchase Source: Sears
Address:
City/State:
Cost: $10.00
Brief Description: Battery operated train moves around xylophone track. Arrangement of track determines tune.

Mickey Mouse Chime Rattle
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Rattle chimes when shaken. Has flexible rubber handle.

AUDITORY

Musical Multi-Touch Bear
Purchase Source: DanDee Imports
Address:
City/State:
Cost: $18.00
Brief Description: Battery operated musical bear. Touch the bear's arm and it plays two of sixteen tunes

Musical Puzzle Box
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $10.95
Brief Description: Musical sounds produced as animal shapes slowly slide down chute.

Play Gym
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $12.65
Brief Description: Figures spin, rattle and squeak on center bar with strap for attachment to crib.

Playring
Purchase Source: The Able Child
Address: 325 W 11th St
City/State: New York NY 10014
Cost: $8.50
Brief Description: Rubber ring with wooden beads. Each bead looks, feels and tastes differently.

Purple Rattle
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Marraca-like rattle.

Rattle Ball
Purchase Source: Toy shop
Address:
City/State:
Cost:
Brief Description: Colorful balls in clear plastic ball roll and bounce when handle is pushed or pulled along.

Ring-A-Round Top (with adapted handle)
Purchase Source: The Able Child
Address: 325 West 11th St
City/State: New York NY 10014
Cost: $17.95
Brief Description: Big Bird and Cookie Monster spin and bell sounds when handle is pushed down.

Rock 'N Roll
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Plastic sphere rocks, rolls and rattles. Another ball whirls inside but won't fall out. Floats in water.

Sensory Stimulation Kit (cat # 1-0861)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $419.90
Brief Description: Kit facilitates the development of basic sensory processes. Materials available separately.

Shapes and Sound Sensations
Purchase Source: Childcraft
Address: 20 Kilmer Rd
City/State: Edison NJ 08818
Cost: $8.95
Brief Description: A set of four, brightly colored shapes. Each shape makes a different sound when moved or touched.

ERIC

AUDITORY

Soft Textured Blocks
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $13.90
Brief Description: Large soft vinyl blocks with different raised designs and numbers. Squeaks when squeezed.

Spin-A-Sound
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $12.25
Brief Description: Paddles, dial, and crank make different sounds when manipulated.

Teddy Bear Rattle
Purchase Source: Discovery Toys
Address: 400 Ellinwood Way
City/State: Pleasant Hills CA 94523
Cost: $4.98
Brief Description: Three balls are in see-through circle on reflective background.

Three Men In A Tub
Purchase Source:
Address:
City/State:
Cost:
Brief Description: Plastic tub rings when rocked or spun. The three men are removable.

Tick-Tock Clock
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Large knobs move clock hands and ring bell.

Tracking Tube
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $6.95
Brief Description: Red ball floats in clear, fluid-filled tube. Has bell and squeaker at opposite ends.

Treasure Cube Hide-N-Seek
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $18.95
Brief Description: Six inch clock cube with hiding places for pliably soft shapes which ring or squeak when twisted or squeezed.

Turbo Tops
Purchase Source:
Address:
City/State:
Cost:
Brief Description: Contains four tops and straws for propelling. Also contains a clear domed base which accommodates tops as they spin.

Turn & Learn Activity Center
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64040
Cost: $12.65
Brief Description: Eight separate action blocks; Crank & Click; color roller, mirror, kaleidoscope, turning pictures, dial, squeaker.

Tweety Bird Squeeze Toy
Purchase Source: Toy/variety store
Address:
City/State:
Cost:
Brief Description: Small rubber bird squeaks when squeezed.

AUDITORY

Wobble Globe
Purchase Source: Kiddicraft
Address:
City/State:
Cost: $7.95
Brief Description: Bright, bouncy ball rattle with suction base.

Wrist bells
Purchase Source: Childcraft
Address: 20 Kilmer Rd Cn 066
City/State: Edison, NJ 08818
Cost: $1.65
Brief Description: Four bells attached to nylon webbing; slips on wrist for hand-clapping.

Xylophone
Purchase Source: K-Mart
Address:
City/State:
Cost: $9.00
Brief Description: Pull-string xylophone.

C. TACTILE

Baby Bear
Purchase Source: Visualtek
Address: 1610 26th Street Dept. C
City/State: Santa Monica, CA 90404
Cost: 15"-$44.00; 21"-$65.00
Brief Description: Acrylic and foam teddy bear that vibrates when hugged.

Braille Colored Pencils
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost: $8.00 (set of 12)
Brief Description: Colors are abbreviated on a braille flag on each pencil. Braille color chart is included.

Brailled Colored Markers
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost: $18.00 (set of 24)
Brief Description: Set of 24 colors have brailled flags and a brailled color chart.

Brailled Mr. Sketch Scented Set
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost: $9.00
Brief Description: Eight color set with brailled labels and brailled color chart. Relates color to scent.

Brailled Temperas
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost: $8.00
Brief Description: Set of six colors with brailled labels and braille chart.

TACTILE

Bristle Blocks
Purchase Source: Contructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $19.50 (57 piece set)
Brief Description: Soft bristled blocks interlock.

Coppertone Group Pack
Purchase Source: Triarco Arts & Crafts
Address: 14650 28th Av N
City/State: Plymouth, MN 55441
Cost: $14.00
Brief Description: Kit contains foil, mold, tools, cardboard frames for creating molds and rubbings.

First Blocks
Purchase Source: Toy store
Address:
City/State:
Cost:
Brief Description: Plastic shapes drop in bucket when fit through matching opening on lid.

Frog Chorus
Purchase Source: Sears
Address:
City/State:
Cost: $9.99
Brief Description: Battery operated "piano". Press keys and colorful frogs open their mouths and "sing". Keys emit vibratory sensations.

Happy Apple
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $8.75
Brief Description: Makes chime-like sound and vibratory sensation when shaken. Floats in water.

TACTILE

Hedgehogs
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $6.50 (set of 3)
Brief Description: Apple size, soft vinyl hedgehogs squeak when squeezed.

HI Marks 3-D Marker
Purchase Source: Ky Industries for the Blind
Address:
City/State: Louisville, KY 40206
Cost:
Brief Description: Squeeze out contents of tube to create raised marks on paper, metal, or wood fabrics.

Melody Mike
Purchase Source: Louisville Toy Palace
Address:
City/State:
Cost: $14.00
Brief Description: Mouth opens and when teeth are pushed musical tones and a vibratory sensation occur. Battery operated.

Mobile Sandbox
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $62.95
Brief Description: Steel sandbox with ball-bearing casters to facilitate its movement to different play areas.

Peg-Board Holder
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost: $8.00
Brief Description: Forty-eight holed peg-board designed to organize brailled colored pencils, colored markers, and imprinting tools.

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TACTILE

Plush Animal Puppets
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $4.25 each
Brief Description: Plush flannel hand puppets with large movable mouths.

Raised Dot Drawing Pad Kit
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost: $20.00
Brief Description: Twenty sheets of bristol paper marked in 1/4 inch increments on inside margins. Imprinting tool is included.

Sensory Stimulation Kit (cat # 1-0861)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $419.90
Brief Description: Kit facilitates the development of basic sensory processes. Materials available separately.

Sewell Raised Line Drawing Kit
Purchase Source: Sewell E.P. Corp
Address:
City/State: Woodside NY 11377
Cost:
Brief Description: A drawing kit with raised line materials.

Tactual-Kinesthetic Stimulation Kit (cat# 1-0863)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $118.95
Brief Description: Various materials to stimulate tactual perception in young handicapped children.

TACTILE

Textured Matching Blocks (cat# 1-0895)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $26.33
Brief Description: Set of 6 blocks with different textures and identically textured seats for block matching.

Vibrator
Purchase Source: Spencer's Gifts
Address:
City/State:
Cost: $6.00
Brief Description: Battery operated vibrator.

Water Play Trough
Purchase Source: Childcraft
Address: 20 Kilmer Rd Cn 066
City/State: Edison, NJ 08818
Cost: $95.00
Brief Description: Transparent water trough for water play activities.

C. TACTILE-VIBRATORY

Baby Bear
Purchase Source: Visualtek
Address: 1610 26th Street Dept. C
City/State: Santa Monica, CA 90404
Cost: 15"-$44.00; 21"-$65.00
Brief Description: Acrylic and foam teddy bear that vibrates when hugged.

Frog Chorus
Purchase Source: Sears
Address:
City/State:
Cost: $9.99
Brief Description: Battery operated "piano." Press keys and colorful frogs open their mouths and "sing." Keys emit vibratory sensations.

Happy Apple
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $8.75
Brief Description: Makes chime-like sound and vibratory sensation when shaken. Floats in water.

Melody Mike
Purchase Source: Toy store
Address:
City/State:
Cost: $14.00
Brief Description: Battery operated toy, mouth opens and when teeth are pushed musical tones and a vibratory sensation occur.

Sensory Stimulation Kit (cat # 1-0861)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $419.90
Brief Description: Kit facilitates the development of basic sensory processes. Materials available separately.

TACTILE-VIBRATORY

Tactual-Kinesthetic Stimulation Kit (cat# 1-0863)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $118.95
Brief Description: Various materials to stimulate tactual perception in young handicapped children.

Vibrator
Purchase Source: Spencer's Gifts
Address:
City/State:
Cost: $6.00
Brief Description: Battery operated vibrator.

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D. VESTIBULAR

Big Teeter
Purchase Source: Contructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $29.95
Brief Description: Polyetylene teeter-totter; can be used indoors or out.

Junior Whirl
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $299.00
Brief Description: Forty-two inch diameter merry-go-round. Base hugs the ground for safety.

School Rocker
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $29.95
Brief Description: Small hardwood rocker. Seat height is 10 inches.

Sit and Spin
Purchase Source:Variety/discount store
Address:
City/State:
Cost: $20.00
Brief Description: Riding toy that spins when child propels self by turning wheel.

Spring Mate with Special Brace
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $214.00 each
Brief Description: Enamel covered animal figures attached to stationary spring for rocking outdoors. Contains back brace, safety belt, and footrests.

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VESTIBULAR

Swinging Gate
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $149.00
Brief Description: Galvanized-pipe gate with center post for 360 degree turns.

Tumbling Mat
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $99.00
Brief Description: Durable, rainbow colored mat for tumbling.

Wagon
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $33.50
Brief Description: Red wagon with pivoting front steering axle and shaft.

Wooden Rocking Horse
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $49.95
Brief Description: Sturdy wooden rocking pony with leather ears and yarn mane and tail.

E. GUSTATORY

Olfactory and Gustatory Stimulation Kit (cat# 1-0865)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankdort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $18.95
Brief Description: Various materials to facilitate olfactory and gustatory stimulation in young handicapped children.

Playring
Purchase Source: The Able Child
Address: 325 W 11th St
City/State: New York NY 10014
Cost: $8.50
Brief Description: Rubber ring with wooden beads; each bead looks, feels and tastes differently.

Sensory Stimulation Kit (cat # 1-0861)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $419.90
Brief Description: Kit facilitates the development of basic sensory processes. Materials available separately.

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F. OLFACTORY

Brailled Mr. Sketch Scented Set
Purchase Source: Tactile Art Products
Address: 405 Oak Tree Dr
City/State: St Louis, MO 63119
Cost: $9.00
Brief Description: Eight color set with brailled labels and brailled color chart. Relates color to scent.

Olfactory and Gustatory Stimulation Kit (cat# 1-0865)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $18.95
Brief Description: Various materials to facilitate olfactory and gustatory stimulation in young handicapped children.

Scratch 'n Sniff Stickers (Set I)
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $7.50
Brief Description: 288 stickers; bubble gum, gingerbread, grape, orange, root beer, and strawberry scented.

Scratch 'n Sniff Stickers (Set II)
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $7.50
Brief Description: 288 stickers; orange, raspberry, candy cane, pineapple, and pickle scented.

Scratch 'n Sniff Stickers (Set III)
Purchase Source: Childcraft
Address: 20 Kilmer Rd CN 066
City/State: Edison, NJ 08818
Cost: $7.50
Brief Description: 288 stickers; chocolate, licorice, root beer, grape, lemon, banana scented.

OLFACTORY

Sensory Stimulation Kit (cat # 1-0861)
Purchase Source: American Printing House for the Blind
Address: 1839 Frankfort Av PO Box 6085
City/State: Louisville, KY 40206-0085
Cost: $419.90
Brief Description: Kit facilitates the development of basic sensory processes. Materials available separately.

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G. MANIPULATIVE

Chunky Nuts
Purchase Source: Contructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $7.95
Brief Description: Ten large nuts to screw on 10 inch bolt.

Cowboys & Indians
Purchase Source: K-Mart
Address:
City/State:
Cost: $1.67
Brief Description: Twenty-five brightly colored, hard plastic figures.

Cradle Gems
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $18.95
Brief Description: Soft shapes each making a different sound when grasped. Can be used separately or suspended by the cord included in the kit.

First Rhythm Band Center
Purchase Source: Contructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $16.95
Brief Description: Twelve inch base holds drum, 2 bells, 4 note xylophone, and mallet.

Firstplay Block Rattle
Purchase Source: Quester Education Products Co
Address:
City/State:
Cost:
Brief Description: Apple sized plastic rattle; contains woods beads for rattling and holes for finger play.

MANIPULATIVE

Fisher Form
Purchase Source: Toy Store
Address:
City/State:
Cost: $19.95
Brief Description: Clear plastic sorter box, shapes filled with beads.

Giant Bolt and Nuts
Purchase Source: Contructive Playthings
Address: 1227 East 119th st
City/State: Grandview, MO 64030
Cost: $4.95
Brief Description: Three large geometric shapes screw into 6 inch bolt.

Keys Play
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $18.95
Brief Description: Five differently shaped keys produce movement and sound when turned in corresponding shapes on play center.

Musical Puzzle Box
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $10.95
Brief Description: Musical sounds produced as animal shapes slowly slide down chute.

Play Gym
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $12.65
Brief Description: Figures spin, rattle and squeak on center bar. Comes with strap for attachment to crib.

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MANIPULATIVE

Pound-A-Round
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $10.95
Brief Description: All enclosed. One push makes striped pole spin and colorful balls dance.

Rubber Puzzle
Purchase Source: Children Love Us Inc
Address:
City/State: Brooklyn NY 11220
Cost:
Brief Description: Rubber shapes puzzle. (Contains small pieces so is not recommended for children under 3 years).

Shapes and Sound Sensations
Purchase Source: Childcraft
Address: 20 Kilmer Rd
City/State: Edison NJ 08818
Cost: $8.95
Brief Description: A set of four, brightly colored shapes. Each shape makes a different sound when moved or touched.

Slinky
Purchase Source: K-Mart
Address:
City/State:
Cost:
Brief Description: Plastic spring-like toy. Available in bright and fluorescent colors.

Soft Textured Blocks
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $13.90
Brief Description: Large soft vinyl blocks with different raised designs and numbers squeak when squeezed.

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MANIPULATIVE

Spin-A-Sound
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $12.25
Brief Description: Paddles, dial, and crank make different sounds when manipulated.

Treasure Cube Hide-N-Seek
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64030
Cost: $18.95
Brief Description: Six inch clock cube with hiding places for pliably soft shapes which ring or squeak when twisted or squeezed.

Turn & Learn Activity Center
Purchase Source: Constructive Playthings
Address: 1227 East 119th St
City/State: Grandview, MO 64040
Cost: $12.65
Brief Description: Eight separate action blocks; Crank & Click, color roller, mirror, kaleidoscope, turning pictures, dial, and squeaker.

APPENDIX C

STUDENT MEDICAL/HEALTH INFORMATION SHEET

CATEGORIZATION OF MATERIALS LIST

FUNCTIONAL SENSORY SCREENINGS

INFORMATION SUMMARY SHEET

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STUDENT INFORMATION SHEET
MEDICAL/HEALTH RELATED INFORMATION

Today's date:

Person completing this form:

Child's name:

Date of birth:

School:

Teacher:

Parents' name:

MEDICAL

A. Diagnosis

B. Medical Problems:

_____ Seizure

_____ Heart

_____ Respiration

_____ Digestion/Elimination

_____ Skin

_____ Other ____________

____

C. Medication:

_____ Yes   Type ____________

_____ No

D. Allergies:

_____ Yes   Type ____________

_____ No

E. Vision: Date of last check-up ______

F. Hearing: Date of last check-up ______

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HEALTH RELATED

A. Does the child have any adverse reactions to:

1. Certain materials (e.g., feathers, wool, plastic, etc.)?

   ______ Yes Type ______________________________

   ______ No

2. Certain environmental conditions (e.g., bright lights, black light, fluorescent lighting, etc.)?

   ______ Yes Type ______________________________

   ______ No

3. Certain sensory stimulaton (e.g., cold, heat, wind/air, wetness, vibration, etc.)?

   ______ Yes Type ______________________________

   ______ No

4. Certain handling/tactile activities (e.g., does not like to be touched on face, near the mouth, foot or stomach, etc.)?

   ______ Yes Type ______________________________

   ______ No

MOTOR

A. How does the child move:

______ rolling on floor	______ walker
______ scooting	______ wheelchair
______ crawling	______ walk with support
______ creeping	______ walk independently

B. What adaptive equipment does the child use:

C. What is the best positioning for the child for gross motor activities:

D. What is the best positioning for the child for fine motor activities:

Other Comments:

CATEGORIZATION OF MATERIALS

Materials: Prior to choosing materials by their sensory qualities (i.e., visual auditory...) determine optimal distance and conditions for presentation. Functional assessments will help you with this process. Note materials that the child has previously shown a preference to.

Sensory Features and Examples of Materials:

A. VISUAL
  a. Brightly colored objects (yellow on black; red on white)
  b. Reflective objects (mylar balloon, mirror, foil)
  c. Illuminated objects (blacklight, flashlight, tensor lamp)
  d. Lighted objects (lighted candle, lite brite, flashlight with colored discs, lighted make-up mirror, Christmas tree lights, "Magic Window")
  e. Size of objects (small rattle punching ball)
     (finger puppet stuffed animal)
     (weebie people stacking rings)
  f. Moving objects (wind-up mobiles, spinning tops, battery operated toys)
  g. Any combination of a-f

B. AUDITORY

Many materials with auditory features have fluctuating characteristics. For example, decibel may be different if you shake a rattle softly as opposed to roughly. Environmental sounds and many materials may include several frequencies at different levels of loudness. Calibrated toy lists can help you make decisions about types of auditory materials to select.

Auditory materials can be grouped into the following categories. Choose several stimuli from each.
  a. Speech
     (e.g., child's name, name of favorite object, clucking/babbling)
  b. Environment
     (e.g., spoon in cup, water pouring, candy/cookie wrapper opening, door slam)
  c. Noisemakers
     (e.g., drum, maracas, toys: Pound-A-Round [Child Guidance], Chatter Telephone [Fischer Price])

C. AUDITORY/VISUAL

Select materials that have both properties and the child responds to. For example, the Happy Apple is fluorescent under a blacklight and is auditory.

D. TACTILE/VESTIBULAR

Tactile refers to being touched and touching. Tactile materials may help the child understand the surface of his/her body. Vestibular refers to being moved and moving. Vestibular materials may enhance the child's awareness of relationship to space.

Be aware of precautions as to seizure prone and shunted children when using the items in these categories.

Examples of Tactile Materials

Water
Air Blower
Texture Mitts
Brushes
Features
Temperature Bags
Weighted Bags
Vibration
Squeeze Toys
Any Combination of the Above

Examples of Vestibular Materials

Sit and Spin
Rocking
Swinging
Rolling
Any Combination of the Above

E. GUSTATORY/OLFACTORY

Gustatory refers to the sense of taste while olfactory refers to the sense of smell. Materials in these categories could heighten awareness or increase discrimination.

Examples of Gustatory Items

Sweet-fruit juice, sugar water
Salty-soda water
Sour-lemon, vinegar
Bitter-tea, coffee

Examples of Olfactory Items

Perfumes
Fruits
Vinegar
Menthol
Peppermint

F. COMBINATIONS OF VISUAL, AUDITORY, TACTILE/VESTIBULAR, AND GUSTATORY/ OLFACTORY

Note: This screening should be administered several times for reliable information. Also, using this screening with functional vision efficiency assessments can provide valuable information for educational programming.

FUNCTIONAL VISION SCREENING

developed by P.G. Kinney and J.A. Goodrich

This vision screening will help you categorize visual materials and determine which visual qualities to which your student responds.

Prior to administering this screening, review the following:

Positioning

Selecting a position that will facilitate responses to visual materials is very important. The position selected should be nonstressful for the child. For example, positioning a child on a beanbag rather than over a bolster that requires head control as well as visual responses may be too demanding. Consult with the occupational and/or physical therapist to determine best positions for children with motor impairments (Cote and Smith, 1982).

Environment

It is important to teach the child to respond visually within the natural environment. Some children will respond best initially to visual materials in environments that are free of distractions, such as other lights, sounds, the window, etc. Alert the child to any change in the environment. Be sure that the child is comfortable and relaxed before evaluating responses to visual materials.

Use of the Black Light

Since many teachers have expressed concern about use of the black light, the following information is taken from Bright Sights: Learning to See. (Bensinger, Dennison, Frere, and Moore, 1984, pp. 5-7)

> In order to obtain the best information possible on the safety of the black light, we wrote to the directors of the opthalmology departments of every major medical center and teaching hospital in the United States, as well as various organizations dealing with eye problems, such as the National Eye Institute and several government agencies. We also made a literature search to find the

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results of any studies that have been done on the subject.

"Black light" is the common name for long wave ultralight energy. Most scientists define wavelengths in terms of nanometers (nm)--one of which is equal to one billionth of a meter, or 10 angstrom units. Black light has wavelengths of 320-380 nm.

The National Institute for Occupational Safety and Health (NISOH) devised exposure standards for the black light and recommendations by the American Conference of Government Industrial Hygienists, and the American Medical Association. Their standards state that for the ultraviolet spectral region of 315 to 400 nm, total irradiance (emission of radiant energy) on unprotected skin or eyes shall not exceed 1000 microwatts per square centimeter for periods greater than 1000 seconds. The lamp available from APH has an irradiance of approximately 385 microwatts per square centimeter at 6 inches from the eye. Naturally, most of the time neither teacher nor student will be working that close to the lamp; moreover, the light will merely be reflected off the fluorescent materials, never shone directly into the eyes.

Black light is generally considered harmless to the average person. However, consult a physician before using a black light with a child who does not have the lens of the eye intact (example: aphakia, the absence of the crystalline lens of the eye; or the absence of the lens due to cataract surgery, etc.). Individuals who are very fair-skinned, photosensitive (some drugs, such as tetracycline, may produce a photosensitivity), or subject to very long-term exposure, should use adequate protection and consult a physician. Also, any condition or syndrome that results in hypopigmentation, such as albinism, warrants caution and consultation with a physician. In **summary, do not use with a child who lacks the lens of the eye resulting from**

conditions such as cataract surgery or aphakia and do not use with a photosensitive or hypopigmentation condition. In these situations, first consult a physician before using the black light.

References

Bensinger, Dennison, Frere, & Moore (1984). Bright Sights: Learning to See. Louisville, KY. American Printing House for the Blind.

Cote, K. S. C. & Smith, A. J. (1982). Look at Me: A Resource Manual for the Development of Residual Vision in Multiply Impaired Children. Philadelphia, PA. Pennsylvania College of Optometry.

FUNCTIONAL VISION SCREENING

Procedures for Administration

1. **Select** a minimum of one material from each of the six categories listed (See Categories of Materials List).

2. **Observe** the student for a minimum of 15 seconds prior to presenting the stimulus, so that you can note any changes occurring in behavior.

3. **Identify** the behaviors that you will observe to determine if they are reliable responses to the visual materials.

   Possible behaviors might include:

pupil dilation	jerk/startle
movement	eye localization
smiling	frowning/crying
visual tracking	head turning
eye blinking	increased activity
vocalization	eye widening
cessation of activity	squinting

   Fill these behaviors in the spaces provided.

4. **Present** the visual materials **from two distances.**

   near (less than 16 inches)
   far (greater than 16 inches)

   This will vary depending on the individual.

5. **Present** each visual material **a minimum of three times** and record responses.

   + = response **- = no response**

6. **Avoid any auditory stimulation, air from squeeze toys, perfumes on your wrist, or anything that might result in a misinterpreted response** while presenting trials.

7. **Analyze** information acquired while presenting trials.

Name ____________________ Observer ____________________

Setting ____________________ Date(s) ____________________

INFORMAL VISION SCREENING

MATERIAL CATEGORIES	OBSERVED RESPONSES>						COMMENTS: (e.g. position, positive/negative response, best distance, etc.)
1. BRIGHTLY COLORED							
	Left						
	Right						
	Midline						
	L						
	R						
	M						
2. REFLECTIVE							
	L						
	R						
	M						
	L						
	R						
	M						
3. BLACKLIGHTED							
	L						
	R						
	M						
	L						
	R						
	M						
4. LIGHTED							
	L						
	R						
	M						
	L						
	R						
	M						

(CONTINUED)

INFORMAL VISION SCREENING

MATERIAL CATEGORIES	OBSERVED RESPONSES>					COMMENTS: (e.g. position, positive/negative response, best distance, etc.)
5. SMALL						
	L					
	R					
	M					
	L					
	R					
	M					
6. LARGE						
	L					
	R					
	M					
	L					
	R					
	M					
7. MOVING						
	L					
	R					
	M					
	L					
	R					
	M					

INCLUDE FINDINGS IN INFORMATION SUMMARY SHEET

ERIC

Functional Auditory Screening *

Developed By The Bay Area Severely Handicapped Project

Rationale

This chapter describes procedures to evaluate responses to sound that a teacher of severely handicapped and/or deaf/blind students can perform in the classroom. These procedures involve presenting various auditory stimuli to the student and watching for reliable changes in behavior. The goal of the procedures is *not* to replace formal audiological assessment by an audiologist or formal medical evaluation by an otologist. If there is question as to the status of a student's hearing, the teacher's first step should be to seek both medical and audiological evaluations.

However, there are at least two reasons why it is important for teachers to be familiar with informal procedures for assessing responses to sound:

1. Formal audiometric test results often do not provide information about how well a student uses the hearing he does have. As Kukla and Connolly (1978) point out, an audiogram can reveal an individual's sensitivity to sound at different frequencies, but it does not reveal how an individual uses his hearing. A student's hearing mechanisms may be intact, but in the classroom environment he may function as if he has no hearing at all. For the student whose formal evaluation indicates no loss, or only a mild loss, the teacher can use informal assessment procedures to evaluate the student's *functional use* of his hearing in the classroom. If the student does not use his hearing functionally, instructional programs may be developed to improve skills such as localizing to sounds or discriminating among sounds.

2. A second reason for the inclusion of teacher based assessment strategies is the determination of particular responses and sound cues that can be used in training individual students for formal audiological assessment. (See the programs in Section III) Many severely multiply handicapped students have only limited and/or idiosyncratic response modes available to them due to extreme physical and/or mental disabilities. By carefully observing responses to auditory stimuli, the teacher may be able to identify a reliable response for use in programs designed to prepare a student for formal testing by an audiologist. Careful observation of a student's responses to a variety of sound stimuli may also reveal which particular auditory cues reliably produce a response. These cues can be considered as initial auditory stimuli in a number of programs discussed later in this manual (see Sections I V).

Developmental Sequence of Auditory Functioning

The validity of "normal" developmental sequences of auditory behavior for severely handicapped individuals remains to be demonstrated, and teachers should not necessarily expect to observe precisely this sequence in every student. However, the developmental sequence of behavioral responses to sound is discussed here to provide the reader with a general framework for understanding auditory functioning. More detailed reports can be found in Cox and Lloyd (1976), Northern and Downs (1978) and Kukla and Connolly (1978).

From birth through the age of approximately 3 months, the neonate's responses to sound are largely reflexive in nature and may include the following: a startle or Moro response; widening, shifting or blinking of the eyes; crying; jerking; frowning; or an abrupt increase or decrease in activities such as sucking. While the newborn's most noticeable early responses are typically to gross sounds such as a door slamming or a telephone ring (Kukla and Connolly, 1978) an increasing body of evidence suggests that speech may be the most effective stimulus for obtaining a response in newborns, infants and children (Northern and Downs, 1978; Eisenberg, 1976; Franklin, 1977). In particular, by the time the typical infant reaches three months of age, many reflexive responses to loud environmental sounds may be inhibited because the infant has learned that these sounds are irrelevant to him, i.e., their occurrence is rarely followed by predictable meaningful experiences. Hence, he learns to ignore them.

Also critical in evaluating the newborn's responsiveness to sound stimuli is the infant's state when the auditory stimulus is presented (Bench, 1971). Thus, for a baby in an active pre-stimulus state, the stimulus may result in activity decrease; for the same baby in a passive, quiet pre-stimulus state, the stimulus may result in activity increase.

Subsequent to the level at which responses to sound are primarily reflexive in nature, some authors, such as Kukla and Connolly (1978), have proposed a level of response which involves attention and/or alerting to sound as indicated by facial expressions, inclination of the head, laughing at familiar sounds, or searching for the sound. According to these authors, familiar sounds (familiar toys, speech, etc.) are most effective in eliciting early attending responses to sound. These attentional responses to sound in turn form the initial step in sound localization. Localization skills typically begin to develop by the time the infant reaches three months of age. For sounds presented at a distance of 12-36 inches from each ear, Table 3 describes the typical localization sequence (Northern and Downs, 1978; Cox and Lloyd, 1976).

Available data also suggest that once the infant reaches 3 months of age, meaningful sounds such as crinkling papers, a spoon stirred in a cup, speech, etc., may be more likely to evoke responses than meaningless sounds such as pure tones (Ewing and Ewing, 1944).

In addition to the above behaviors, the infant is also developing a number of other auditory skills described by Kukla and Connolly (1978). These include auditory *discrimination* skills, or the ability to differentiate among sounds (are sounds the

AGE	BEHAVIOR
4-6 months	Child turns directly to sound presented laterally on plane level with the ear.
7-10 months	Child turns head to side, then downwards to identify sound presented laterally below the ear.
9-11 months	Child turns directly to sounds presented laterally in a plane below the ear.
11-14 months	Child turns head to side, then upwards to identify sound presented laterally above the ear.
13-18 months	Child turns directly to sounds presented laterally in a plane above the ear.
19-24 months	Child directly localizes to any angle. However, sounds presented directly above or behind the head may not be correctly localized until later ages.

TABLE 3

same or not the same, based on spectral characteristics, length, intensity, rhythm, pitch, etc.); and auditory *recognition* skills, or the ability to obtain meaning from sounds and/or to attach meaning to sounds (following simple directions, identifying objects on the basis of their speech labels, etc.). Thus, in addition to the development of localization skills during the first two years of life, auditory discrimination skills are reflected in vocal imitation, and differential responses to different sound sources. The child may babble in response to human voices, but cry in response to a sudden thunderclap, indicating that he discrimates the two sounds as different from one another. By 18 months of age, initial recognition skills are also developed. The child shows understanding (reception) of some words by appropriate behavior such as looking at familiar objects upon request, and begins to use expressively (expression or production) a small vocabulary of meaningful words. From this point on, normal auditory functioning involves the development of increasingly sophisticated linguistic skills, discussion of which is beyond this manual's scope.

General Considerations

In evaluating an individual's response to sounds, a number of factors come into consideration, including individual characteristics of the student being evaluated, general setting variables, properties of the auditory stimuli used in evaluation, and dimensions of possible response modes, particularly with severely multiply handicapped students. These factors are discussed below and should be thoughtfully considered for each individual student undergoing evaluation.

Student characteristics. A major consideration is *appropriate positioning* of a student before presenting assessment items. Ambulatory students and/or students capable of independent sitting should be seated at a table or desk. For students with severe physical disabilities (e.g., extreme spastic quadriplegia or athetosis, scoliosis, hypotonia, etc.) the first step is consultation with a physical or occupational therapist. Explain to the therapist the kinds of responses you will be watching for, such as searching or blinking of the eyes, head turns, and changes in activity level. Determine a position which normalizes muscle tone and facilitates whatever voluntary movement the student may have, but which will also still allow you to present the sound stimulus at various locations to the side and back of the student, and will allow you to observe potential responses (e.g., eye movements will be difficult to observe closely if the student is in a side lying position). Also confirm whether or not the student shows abnormal reflex activity, such as asymmetrial tonic neck reflex, to a particular side, as a localization response to that side may stimulate undesirable abnormal motor patterns.

In working with newborns and infants, debate continues as to whether the infant should display a high or low state of activity level when the auditory stimuli are introduced. Several authors (Bench, 1971; Taylor and Mencher, 1972) report that a state of light sleep predisposes the best response to sound in neonates, suggesting that a low activity state may yield best responses. If the student you are evaluating will remain seated and cooperative for a 15-20 minute session without objects to manipulate or a simple task to perform, the assessment can be performed in this passive activity state. However, many severely handicapped students will not remain attentive if required to sit passively for 15-20 minutes, and may instead engage in self-stimulatory/stereotypic behaviors or attempt to leave the session. For these students, a toy or fine motor task may be presented for manipulation during the test session. Caution should be taken not to use a task which is so highly reinforcing that the student no longer attends to the teacher, and the teacher should be prepared to frequently introduce new and varied objects.

Arguments also can be made for evaluating responses when a student is in a high state of activity and is displaying repetitive and or stereotypic behavior patterns. Cessation of activity (often of repetitive activities such as rocking) may also provide a reliable form of responses.

Setting: In general, our recommendation is to perform the functional assessment in the context of the normal *classroom environment*. However, it should be noted that the ambient noise level (intensity level of general background noise) may range from 58 to 68 dB SPL in a typical classroom. This means that an auditory testing stimulus of 65 dB SPL or lower may not be discriminated in the context of normal classroom noise levels. (Intensity characteristics of the stimuli used in testing are discussed in detail below.)

Auditory Stimuli: Several testing stimuli should be selected from each of three categories: speech, environmental sounds, and noise makers. Examples of each are presented in Table 4. Use of broad spectrum sounds (sounds which include a wide range of frequencies) is recommended, as it will increase the likelihood of obtaining responses. A student with a high frequency loss, for example, may still respond to low frequency sounds and can respond to the low frequency components of a broad spectrum sound. Since the goal of this assessment is not to obtain hearing thresholds at differing frequencies, high and low frequency sounds need not be presented separately, as they are during formal evaluations. Items in Table 4 are some examples of broad spectrum sounds.

SPEECH	ENVIRONMENTAL	NOISEMAKERS
Child's name	Spoon in cup	Drum
Name of favorite object	Water pouring	Maracas
Clucking/Babbling	Candy/cookie wrapper opening	Toys: Pound-A-Round from Child Guidance
	Door Slam	Chatter Telephone from Fisher Price

Table 4

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Seating: Quiet area of the classroom. The child should be seated at a desk or [illegible], or appropriately positioned in light [illegible] above. Materials: Prerecorded and [illegible] auditory stimuli [illegible] for the student. Data sheets [illegible] position filled in.

Reinforcement: Social and/or tangible reinforcers may be delivered on a non-contingent basis to maintain the student's cooperation.

Procedures: One adult (a test assistant) should be seated directly behind the student with a copy of the data sheet and the auditory stimuli easily at hand. The second adult (preferably the teacher or someone familiar with the student) should be seated directly in front of the student. The teacher will observe the student, cue the assistant when to activate the auditory stimulus, and record the student's response. The steps are presented below.

1. Before presenting the actual asses-

INFORMAL AUDITORY ASSESSMENT

Name ______________________ Speech Stimuli ______________________

Date ______________________ Environmental Stimuli ______________________

Approx. d_B level ______________________ Noisemakers ______________________

Aided or Unaided Test ______________________ Most recent audiological ______________________

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	No Change	Other (Describe)
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												

TOTALS ______________________

Total trials on which responses were observed: (X/10) ______ Total responses to Right ______

Total responses to speech ______ Left ______

Total responses to environmental sounds ______

Total responses to noisemakers ______

Most frequent response type: ______________________

Comments

ment items, observe the student for 3-5 minutes to become familiar with any motor activity patterns.

2. Test assistant: Position the stimulus 2-3 inches to the right or left of the student's posterior midline, and the specified distance needed for the correct intensity. Follow the positioning on the data sheet.

3. Teacher: Wait 3-5 seconds after the positioning of the stimulus to avoid creating visual cues. Then observe the student. When you judge him to be in an appropriate state, cue the assistant to activate the stimulus.

4. Assistant: On cue, activate the stimulus for 2-3 continuous seconds.

5. Teacher: Observe the student and record 1) the type of stimulus, and 2) *all* of the responses you see on the data sheet.

If, immediately after a given trial, it is your judgement that the cue was poorly timed (for example, the stimulus coincided with an involuntary tremor, spasm, etc.) do not record the data and re-present the trial.

Criteria: If the student responds to 80% or more of the trials on the first session, further assessment sessions are not recommended. If responses are inconsistent, at least 2 separate sessions for each dB level are recommended, or as many sessions as you need to feel confident of your results.

Assessment Results

Types of information: If the assessment is repeated several times with a particular child, several types of data can be gathered, including 1) overall presence or absence of responses to sound; 2) identification of a consistent response type across sessions (i.e., the student most frequently responds with an eye-leading reflex); 3) identification of particular auditory stimuli to which the student consistently responds (i.e., student responded to 75% of the speech stimuli, but not at all to environmental sounds); 4) identification of a consistent side to which the student responds (i.e., student quieted to 60% of stimuli presented to left side and 10% of stimuli presented to right side): and 5) identification of approximate intensity levels at which responses are consistently observed.

Applications and educational implications: At the beginning of this chapter, a number of reasons for performing this assessment were discussed, including evaluation of a student's functional use of his hearing and identification of preferred response modes and/or auditory stimuli for use in auditory training programs. Regardless of the reasons which motivated the informal evaluation, it is *not* a replacement for evaluation by an audiologist, and teachers should *not* make the inference that a child does or does not hear based upon this assessment. With practice and careful observation, teachers *may* be able to identify conditions under which a particular child demonstrates a consistent reliable response to a sound stimulus. However, the inference that the presence or absence of such responses means the child can or cannot hear is one that only a trained audiologist can make. The first step in utilizing your results, therefore, is to share them with a clinical audiologist. Explain why you performed the assessment in the first place. For example, the child may have no documented hearing loss, but does not respond to verbal cues in the classroom, and you are looking for a response to use in a functional localization program. If your objective in administering the assessment was to identify either a consistent response mode or a reliable auditory stimulus and you have been able to do so, use this information in carrying out instructional programs in Section II which are appropriate for the needs of your students. Also, share this information with the audiologist, as it may be helpful during formal audiologic test sessions.

Project development data. Project personnel evaluated a total of 17 severely handicapped students using these procedures. The average inter-rater reliability coefficient for two classroom personnel watching one student was .74. The range of reliability scores was .35 to 1.00, with a median of .75. As these data indicate, there was considerable variation in realiability measures, even after repeated experience using the assessment. Project personnel who worked with this procedure generally expressed a lack of confidence in understanding implications of the assessment, even in instances of high reliability of measurement. Thus, even when two persons were readily able to agree that a response had taken place, it was impossible to comment on what this response meant.

For this reason, emphasis is placed not upon perfecting teacher assessment but upon developing classroom programs that can facilitate formal audiological evaluation. Such programs are detailed in Section III. The procedures described here should be carried out only 1) to identify responses/stimuli for use in programs in Section III; 2) to provide supplemental data to support a teacher's concern about the status of a student's hearing; and 3) to indicate a student's functional use of his hearing if it is known to be within normal limits. If a student requires an audiological evaluation, application of one of the programs in Section III represents the most beneficial use of instructional time.

* The material in this screening was taken from Auditory Assessment and Programming for Severely Handicapped and Deaf-Blind Students (pp.8-12) by The Bay Area Severely Handicapped Project.

This section was originally titled "Teacher Based Informal Assessment".

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FUNCTIONAL SOMATOSENSORY SCREENING
developed by Jo Teachman Sprague, M.S., O.T.R.

This sensory screening will enable you to collect information on how a child is using his or her tactile, vestibular, gustatory, olfactory, and proprioceptive-kinesthetic senses. While these senses are not used as much as the auditory and visual modes in obtaining information, they are critical ones in interpreting environmental experiences. For the child who is deaf-blind, materials that offer input through the somatosenses may make the difference in responding or not responding to an activity.

This screening has been divided into two sections, the history and the checklist. In order to get adequate information on the type of stimuli to which the child responds, what responses are positive and negative, etc., **it is important that both sections be completed.**

Before completing any of the somatosensory screening, please take the time to read the directions carefully.

These directions will explain:

* What Each Sense Is
* Examples of Responses That Might be Observed In Children Who have Sensory Impairments or Multiple Handicaps
* Cautions to be Aware of When Administering Items
* Directions on How to Take the History and Administer Items on the Checklist

THE SOMATOSENSES

The **tactile sense** is our sense of touch. It refers to both touching and being touched. Children use tactile information to discriminate what they are touching and what is touching them.

The **vestibular sense** relates to the reactions we have to moving and being moved. The sensations we feel when riding in a car or skipping are both reactions of the vestibular sense.

Gustatory and olfactory senses are the sense of taste and the sense of smell. While these two senses may not be the ones predominantly used in sensory integration, they do provide useful information for learning and for making meaning out of the environment.

The **kinesthetic-proprioceptive system** enables a person to detect where his/her extremeties are in space and in what direction the extremeties are moving. This sense is important in developing orientation skills.

BEHAVIORS COMMONLY OBSERVED IN RESPONSE TO SOMATOSENSORY STIMULATION

Responses can be divided into three general categories; positive, negative, and neutral or undetermined. While obvious positive or negative responses are easy to identify, children who experience more severe handicaps may exhibit behaviors that are harder to interpret. For example, a child may increase movement after being rubbed with a rough textured cloth. You, as the observer need to determine if:

a. the action is truly a response to the stimuli

b. if the response is positive or negative

A person familiar with the child is the best person to interpret the child's behavior.

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SOMATOSENSORY SCREENING: HISTORY

This history should be completed both through an interview with the parent or caregiver and through your observation of the child.

Responses on this history should help you to:

*select items to use in administering the checklist

*determine what responses the child already has to different types of stimulation

*determine if a referral to a therapist for a more in-depth evaluation is indicated.

A referral for a sensory integration evaluation is in order:

*if you cannot determine why a child is exhibiting an atypical behavior.

*if you note that there are a lot of negative reactions.

This is especially important in looking at proprioceptive-kinesthetic responses. No checklist is given for a functional proprioceptive assessment since this is a difficult area even for occupational and physical therapists to assess.

Complete the History and include the findings in the Information Summary Sheet.

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Name____________________ Observer____________________

Setting____________________ Date(s)____________________

SOMATOSENSORY SCREENING: HISTORY

Observed Behavior	Yes	No	Comments
TACTILE			
1. Shows preference for smooth vs. rough, uneven textures?			
2. Reacts negatively to haircut, barefoot in grass, breezes, shampoo?			
3. Reacts negatively to close-fitting clothes (e.g. turtleneck shirt)?			
4. Drops objects right after grasping in absence of muscle weakness?			
5. Appears undersensitive to pain (e.g. cuts, bumps, etc.)?			
6. Excessive need to touch?			
7. Delayed taking solid foods; choked, spit out foods?			
8. Preference for soft-textured foods?			
9. Self-stimulation:			
a. bites?			
b. head bangs?			
c. taps fingers on objects?			
d. mouthes objects?			
e. fingers in mouth?			
f. grinds teeth?			
VESTIBULAR			
1. Self-stimulation:			
a. rocking?			
b. twirling?			
c. bouncing?			
2. Toe-walking, in absence of heel cord spasticity?			
3. Prefers fast movement to slow movement?			
4. Prefers slow movement to fast movement?			
5. Responds negatively to elevators?			
6. Gets car sick?			
7. Fearful moving about in space?			
8. Never crawled (went from sitting to standing)?			
9. Prefers to be held on moving equipment?			

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SOMATOSENSORY SCREENING: HISTORY

Observed Behavior	Yes	No	Comments
PROPRIOCEPTIVE-KINESTHETIC			
1. Low muscle tone (floppy trunk and extremeties)?			
2. Self-stimulation: arm flapping?			
3. Self-stimulation: hand posturing?			
4. Tight grasp in absence of spasticity?			
5. Tires easily?			
6. Needs external support (e.g. always leaning against furniture or person)?			
GUSTATORY/OLFACTORY			
1. Reacts to changes in taste?			
2. Reacts to changes in odors?			
3. Shows preference for certain tastes?			
4. Shows preference for certain smells?			
5. Appears to associate an odor with an activity or person?			
6. Uses smell to explore items?			

INCLUDE FINDINGS IN INFORMATION SUMMARY SHEET

SOMATOSENSORY SCREENING: CHECKLIST

Directions

1. Present the selected stimuli. Observe the child for a response. List the responses noted in the spaces provided at the top of the checklist.

2. In the appropriate grid box, note whether the response was positive (+), negative (-), or neutral or undetermined (+/-).

3. Note any relevant comments that will help later with planning (e.g. "cries in morning but is more accepting of stimuli in afternoon").

4. After completing the checklist, summarize findings in the Information Summary Sheet. Use this information to help select materials for intervention activities. **For individual areas, please note special directions.**

GENERAL CAUTIONS

1. Do not force stimuli on an obviously distraught child. If a child is upset with an activity, try administering the item several times over several days, preferably at different times of the day.

2. Some olfactory stimuli can be irritating to fragile nasal membranes. Do not overstimulate and do observe the child for signs of irritation.

3. In administering tactile items, discontinue the activity if the child is obviously annoyed or if an aggressive response results. Just note in the comment section that the child had a tactilely defensive response.

4. Consider medical conditions that may be aggravated by putting the child through any activity. **If you have any doubts about an activity, don't do it. Obtain additional information or assessments before continuing.**

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TACTILE

General Tips

Administer items several times over several days.

Because the nervous system functions differently at different times, do tactile screening activities at various times of the day to determine the consistency of the response.

Some items repeated over and over can produce a negative response. If this happens, administer items at separate times to avoid a cumulative effect.

Tactile items should be administered from deep pressure to light touch (e.g. hug before tickling with a feather). Light touch tends to be more aversive.

Directions

Human Touch: Administer items three times, approximately 3 seconds each.

Hug: Firmly

Tickle: Back of neck, stomach (gently)

Light Stroke: Gently brush cheeks and arms with fingertips

Textures: Select at least 2 stimuli and administer approximately 60 seconds each.

Sand: Place hands and feet in sand. Move hands and feet if child does not do so spontaneously.

Water: Use lukewarm water. Follow same method as above.

Fingerpaint: Place palms in fingerpaint on table. Follow same method as above.

Face Wiped: Use light pressure with both wet and dry cloth.

Shaggy Texture: Place child barefooted on 1. grass 2. shag carpet.

Vibrator: Administer three times, approximately three seconds each on cheeks, back, arms, palms. Caution: **Use battery powered vibrator only. Do not vibrate directly over bone, over blood vessels that are close to skin, or on the heads of children with hydrocephalus or shunts.**

Soft: Swipe briefly (approximately one second) three times each on cheeks, neck, arms, palms.

Feathers: eg. feather duster

Fur: eg. furry toy

Cotton Ball

Other

Miscellaneous: Two examples are described here:

Plastic: Move child's palms over hard, smooth surface three times, approximately three times each.

Sharp: Gently touch both forearms with pencil point three times, approximately one second each, in three different places.

VESTIBULAR

Directions

Therapy Ball: (Approximately 24-26 inch diameter)

Rock while sitting:
forward-backward 3-4 times gently and slowly
side-to-side 3-4 times gently and slowly

Rock while prone (on stomach):
forward-backward 3-4 times gently and slowly
side-to-side 3-4 times gently and slowly

Bounce while sitting supported securely by examiner's hands

Rock up-end (legs higher than head) in prone position: Gently and slowly rock forward so that head is upside down and hold for 2-3 seconds before bringing up. **CAUTION: Do not administer this item if student is shunted.**

Swing: If available, use platform swing or hold child on playground swing.

Rotary swinging: Spin slowly and gently for 5 seconds. **CAUTION: Do not administer this item if student is shunted.**
Linear swinging: Forward-backward movement for 20 seconds.

Lying in Prone Position: Place child on stomach and observe for 1-2 minutes. A significant response (resisting, crying, etc.) will usually occur almost immediately.

Rocking Chair: Hold child sitting on lap, slowly rock for 30 seconds.

Toss In Air: Quickly lift child in air over examiner's head, holding child's trunk. **CAUTION: Do not let go of student at any point. Lift only students whose weight can be safely lifted.**

GUSTATORY (TASTE)

Directions

Select a variety of taste experiences for the child. Lemon, honey, vinegar, chocolate syrup, salt water, and tonic water have been selected for this checklist. You may wish to add others.
Use a medicine dropper to place 1cc. of substance on tongue. Give a drink of water between stimuli.

OLFACTORY (SMELL)

Directions

Select a variety of "smelling" experiences for the child. Perfume, vanilla extract, and vinegar have been selected for this checklist. You may wish to add others.
Place 2 drops of substance on a cotton ball. Pass under nose (1 second duration) 3 times each.

EXAMPLES OF RESPONSES

The following responses are examples of those that might be observed in a student who is deaf-blind, severely handicapped, or multi-handicapped. Most of the responses given could be observed in a variety of situations. Others are more specific in response to a particular type of somatosensory stimulation. Of course, many other responses might also be observed.

WANTS MORE: Child indicates that more stimulation is desired (e.g. stays on equipment, motions to continue, pulls at adults, etc.)

LAUGHS, SMILES: Obviously in response to stimulation

STOPS NEGATIVE BEHAVIOR: Ceases previous behavior such as crying, self-stimulation, etc.

CRIES: Obviously in reponse to stimulation.

GRIMACES: Facial expression of jaw clenching and/or lip reaction in response to stimulation.

HESITANT: Cautious, reluctant to get on equipment, does not move when placed on equipment, reluctant to touch objects, etc.

BECOMES RIGID: Goes from relaxed to stiff position, does not move easily on equipment, does not adjust body to movement of the activity.

SWEATS: Perspires in response to movement or other activity.

BREATHING QUICKENS: Respiration rate increases with stimulation, breathing becomes rapid and shallow as compared to state prior to stimulation.

FLUSHES OR BLANCHES: Skin reddens or whitens markedly.

GRABS EXAMINERS: (vestibular) Grabs for examiner when otherwise supported, in response to movement.

TRIES TO GET OFF:(vestibular) Consistently and immediately attempts to get off equipment or out of position.

LOSES BALANCE:(vestibular) Falls off equipment or leans heavily on examiner.

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Name________________ Observer________________

Setting________________ Date(s)________________

SOMATOSENSORY SCREENING: CHECKLIST

STIMULI (OBSERVED RESPONSES>)					COMMENTS
Tactile					
1. Human Touch					
a. Hug					
b. Tickle					
c. Light Stroke					
2. Textures*					
a. Sand					
b. Water					
c. Finger Paint					
d. Shag Texture on feet					
e. Other					
3. Vibrator**					
4. Soft					
a. Feathers					
b. Fur					
c. Cotton Ball					
d. Other					
5. Miscellaneous					
a. Plastic					
b. Sharp					
c. Dull					
d. Temperature/Hot					
e. Temperature/Cold					
f. Other					
Vestibular					
1. Therapy Ball					
a. Rock					
b. Bounce					
c. Up-End					
2. Swing					
a. Rotary					
b. Linear					
3. Prone Position					
4. Rocking Chair***					
5. Toss in Air***					

(CONTINUED)

CURRICULUM ADAPTATIONS FOR THE DEAF-BLIND PROJECT
STUDENT INFORMATION SUMMARY SHEET
BACKGROUND, FUNCTIONAL ASSESSMENT, INSTRUCTIONAL GOALS

Child's Name:

Date of Birth:

Today's Date:

I. Background Information Summary

Note information that might affect child in an instructional activity

MEDICAL

1. Diagnosis:
2. Medical Problems:

____Seizures ____Digestion/Elimination ____Motor Involvement

____Heart ____Skin

____Respiration ____Other: ________________

3. Medication: ____yes ____no Type ________________
4. Effects of medication: ________________
5. Allergies: ____yes ____no Type ________________

VISION

1. Visual Acuity: left____ right____ unknown____
2. Glasses: ____yes ____no

HEARING

1. Auditory loss (decibel) left____ right____ unknown____
2. Type of loss ____sensorineural ____conductive ____combination
3. Hearing aid ____yes ____no type ________________

EDUCATIONAL

1. Current estimate of developmental functioning level:

ERIC

Information Summary Sheet
Page 2

II. Functional Assessment Summary

Note information gathered from functional assessments that might affect child's performance during instructional activities.

VISION

1. Percentage of responses to: _____left _____right _____middle

2. How far from the child was the material when response was observed?

3. List materials/toys that elicited responses:

AUDITORY

1. Percentage of responses to: _____left _____right _____middle

2. How far from the child was the material when response was observed?

3. List materials /toys that elicited responses:

TACTILE

1. List materials that elicited positive responses:

2. List materials that elicited negative responses:

VESTIBULAR

1. List materials that elicited positive responses:

2. List materials that elicited negative responses:

GUSTATORY/OLFACTORY

List materials and types of responses:

POSITIONING

1. Describe positioning of child that leads to optimum responses:

2. Describe special equipment needed:

COMMUNICATION

1. Describe communication system currently in use:

2. Describe communication system to be used with instructional activities:

RESPONSE BEHAVIORS

1. Describe child's behaviors that indicated a response(s) during the following functional assessment areas: (i.e., startles, eye blinks, etc.)

   a. Vision:

   b. Auditory:

   c. Tactile:

   d. Gustatory/Olfactory:

   Other Information: ______________________________

III. Instructional Goals Summary

1. Name of curriculum currently in use:

2. Describe short-term objectives:

3. Describe long-term functional goal associated with each of the short-term objectives: